314

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Chevrolet	987364, 987366 Prod. Chg. Bul. 152	314-1
Columbia Records	316	314-2
Continental	220 Recorder	314-3
Fleetwood	810 Tel. Rec.	314-4
General Electric	920, 921	314-5
Grommes	55C	314-6
Hallicrafters	S-95 (Run 1)	314-7
Magnavox	Chassis CMUB400CE, CMUB405CE, CMUB406CE, CMUB407CE, CMUB418CE, CMUB419CE, CMUB422CE, CMUB425CE, CMUB426CE, CMUB430CE, CMUB431CE, CTB400CE, CTB405CE, CTB406CE, CTB407CE, CTB418CE, CTB419CE, CTB422CE, CTB425CE, CTB426CE, CTB430CE, CTB431CE Tel. Rec. PCB 152	314-1
McIntosh	C-8, C-8P, D-8	314-8
RCA Victor	21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A) Color Tel. Rec.	314-9
Sentinel	1U-364	314-10
Stromberg-Carlson	XP21, 22 Series, X21, 22 Series Tel. Rec.	314-11
Zenith	X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU, X2365EQ, EQU, HQ, HQU, X2383, R, RU, U, X2391EQ, EQU (Ch. 20X20, 20X20Q, 20X20U) Tel. Rec.	314-12
Westinghouse	H-756T17-H766T17 -H765T417, H766T417 H-810T17-H811T17- H810T417, H811T417 Ch. (2240-1-3-2-	314- ~~Spec~~ Front Service
Coronado	TV1-930SA (Gamble Skogmo)	314-13-S.
Zenith	y. 2229R - y2230EorR - y225E-R - y2254m y-2263R. (ch. 19y22)	314-13S

The PHOTOFACT Servicer

Vol. 32. Nos. 313 & 314 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ March 15, 1956

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

WESTINGHOUSE CHASSIS V-2240-1, V-2240-2, V-2240-3

MODEL	CHASSIS	TUNER NO.
H-756T17, H-766T17	V-2240-1 or V-2240-3	V-11794-1 (VHF) or V-12415-1 (VHF)
H-765TU17, H-766TU17	V-2240-1 or V-2240-3	V-11794-1 (VHF) or V-12100-1 (VHF) and Model H-804-1, -2, -3 (UHF)
H-810T17, H-811T17	V-2240-1 or V-2240-2	V-11794-1 or V-12100-1 (VHF)
H-810TU17, H-811TU17	V-2240-1 or V-2240-2	V-11794-1 or V-12100-1 (VHF) and Model H-804-1, -2, -3

When the letter "U" appears in the model number, it indicates the receiver contains an all-channel UHF Tuner in addition to its VHF Tuner. For information on Tuners V-12100-1 and V-12415-1 see Set 255-17.

Chassis V-2240-2 & V-2240-3 are identical to late production chassis V-2240-1 with the exception of tuners.

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PRODUCTION CHANGES - CHASSIS V-2240-1

In production, any or all of the following changes may be incorporated in V-2240-1 chassis.

1. R450 is changed from 6.8K to 12K to prevent horizontal overdrive.

2. A condenser C447, 47mmf. is added between the plate (pin 5) of the 6AU6 sync separator and ground. C447 provides additional video modulation filtering to prevent bending of the picture at the top.

3. R316 is increased to 270K and R332 to 120K to prevent picture streaking at high brightness.

4. C100, .005 mfd., and C101, .005 mfd. are replaced with a dual .005 mfd. capacitor. The new capacitor is designated C100.

5. C206, .005 mfd., and C208, .005 mfd. are replaced with a dual .005 mfd. capacitor. The new capacitor is designated C206.

6. Filament choke L505 part #V-4886-2 has been added in series with the filament (pin 3) of the 6BN6. A 12K resistor has been inserted between R203, 470 ohms and C211, .02 mfd. These changes were made to reduce tweet in the picture caused by harmonics generated in the 6BN6.

7. C419 is changed from 100 mmf. to 150 mmf. to improve the locking range of the horizontal hold control.

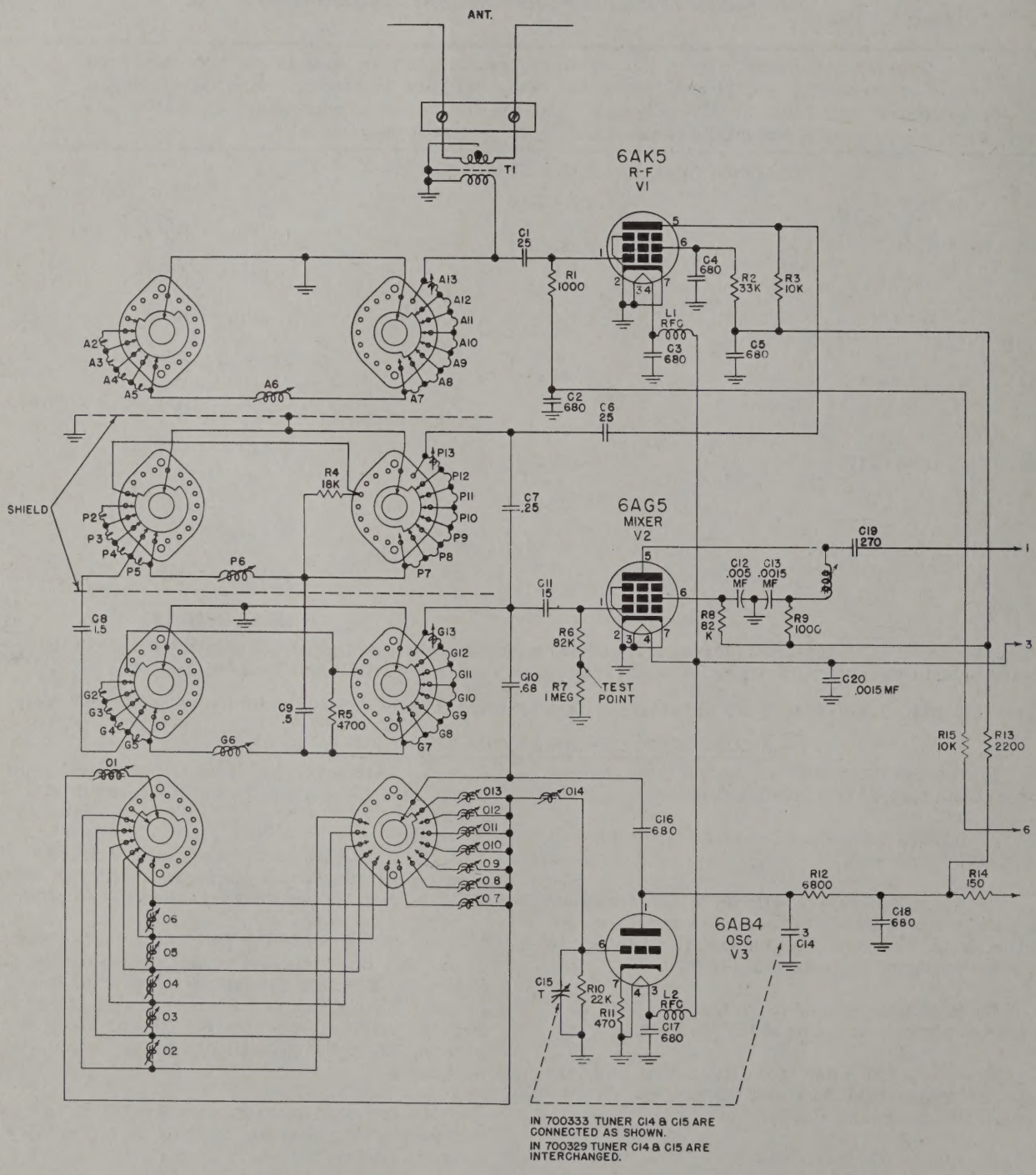
8. C302, 1.5 mmf. has been changed to 2.2 mmf. to increase sound attenuation. With this change C301, 3.3 mmf., is unnecessary and has been removed.

9. To increase the gain of the pentode section of the 6X8 when working as an IF stage for the UHF tuner, the 220 ohm cathode resistor is connected to ground. This is done by soldering a piece of #22 wire from the junction of the 220K resistor and wafer switch section 1B to the ground terminal of wafer switch section 2A.

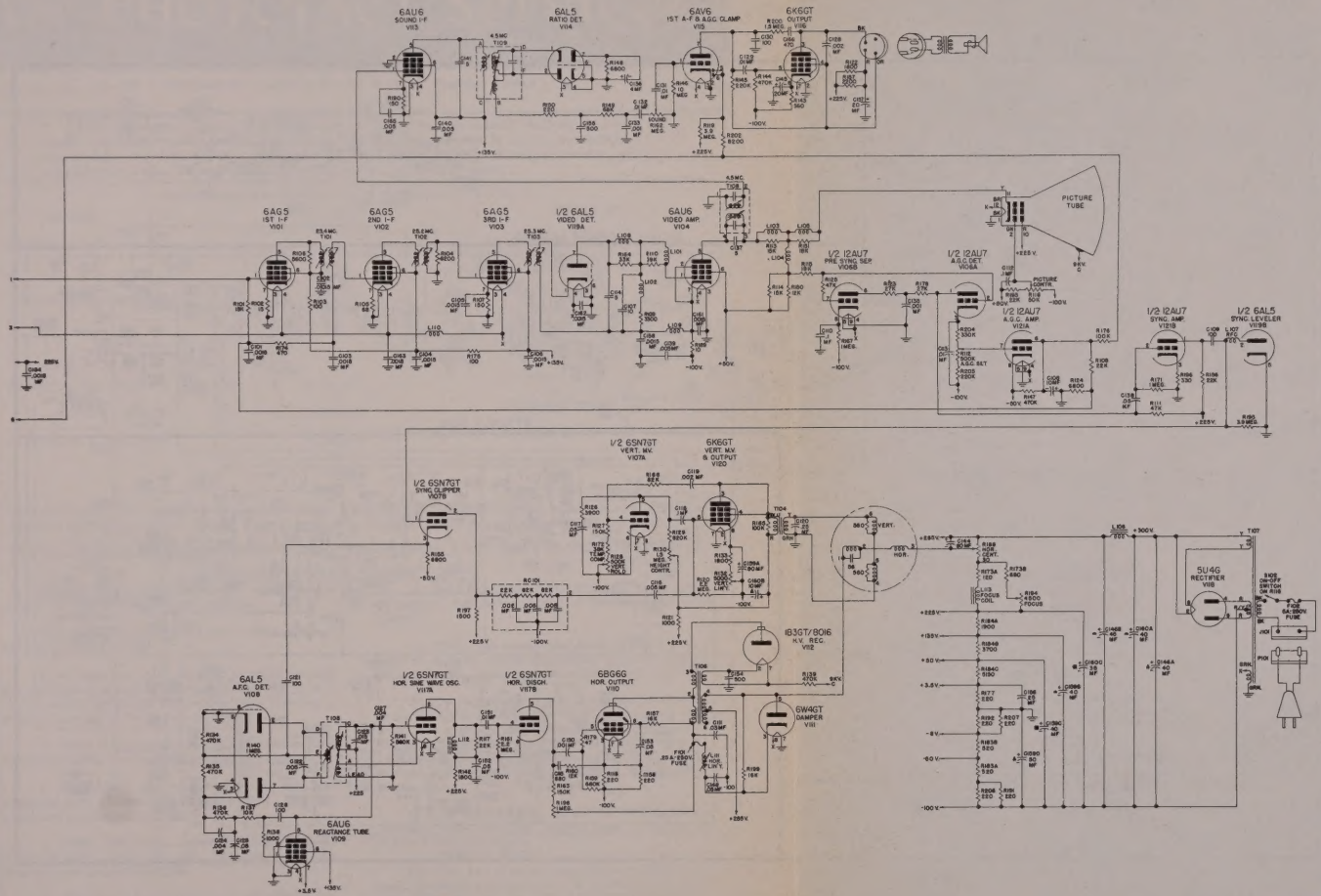
10. Ion trap magnet, part V-9784-5, has been replaced with, ion trap magnet, part V-9784-4 to improve ion trap action.

11. The two outside connections to R400 have been reversed, decreasing the B+ to the picture control, thus stabilizing the picture brightness at various settings of the picture control.

12. To prevent slippage the UHF tuner drive belt has been replaced with part V-11338-4.

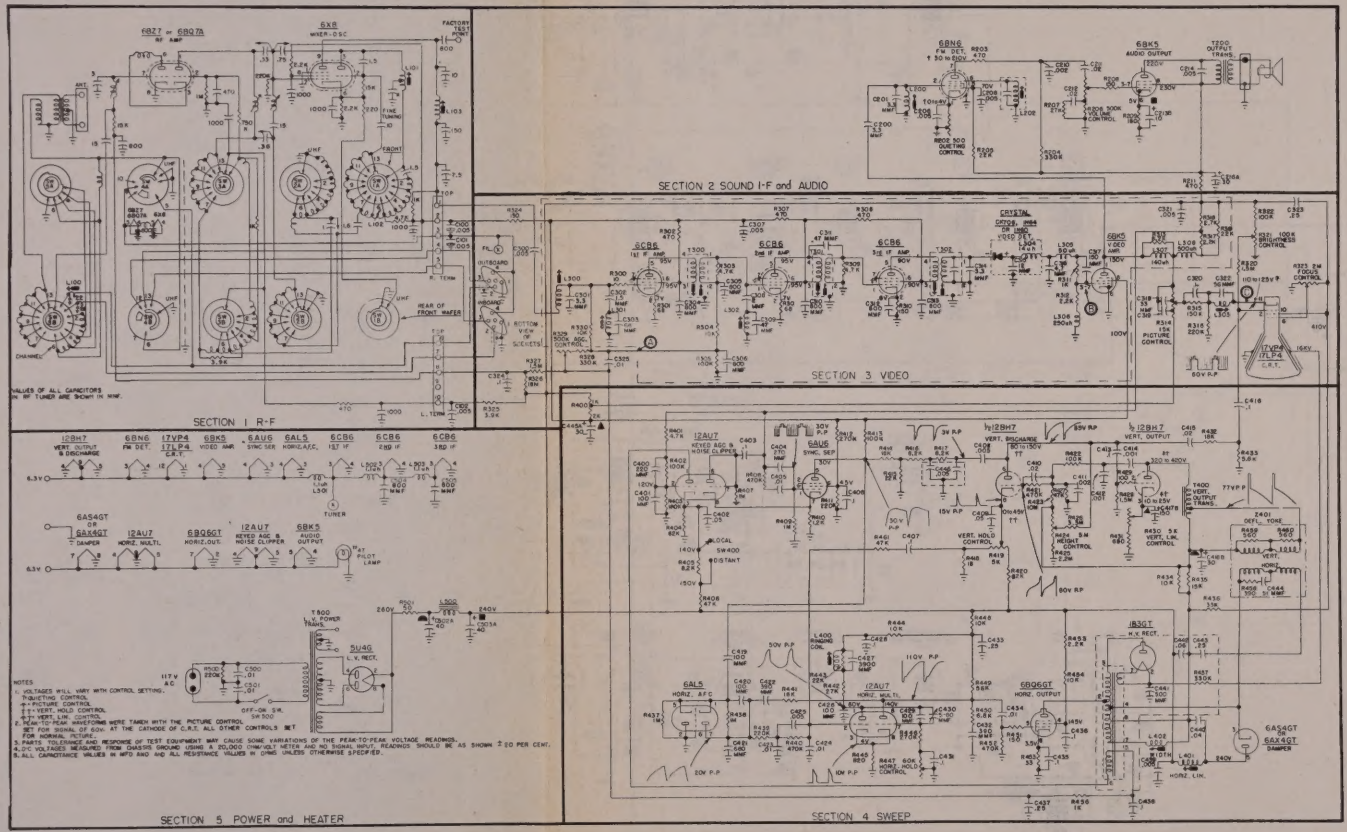


RF Tuner - Magnavox Chassis Models CT247, CT248, CT249



Magnavox Chassis Models CT247, CT248, CT249

Schematic Diagram Courtesy of Magnavox Company.


SECTION 1 R-F
SECTION 2 SOUND I-F and AUDIO
SECTION 3 VIDEO
SECTION 4 SWEEP
SECTION 5 POWER and HEATER
NOTES
1. VOLTAGES WILL VARY WITH CONTROL SETTING.
2. PEAK-TO-PEAK WAVEFORMS WERE TAKEN WITH THE PICTURE CONTROL SET FOR SIGNAL OF 60V. AT THE CATHODE OF C.R.T. ALL OTHER CONTROLS SET FOR NORMAL PICTURE.
3. PARTS TOLERANCE AND RESPONSE OF TEST EQUIPMENT MAY CAUSE SOME VARIATIONS OF THE PEAK-TO-PEAK VOLTAGE READINGS.
4. D.C. VOLTAGES MEASURED FROM CHASSIS GROUND USING A 20,000 OHM-VOLT METER AND NO SIGNAL INPUT. READINGS SHOULD BE AS SHOWN ± 20 PER CENT.
5. ALL CAPACITANCE VALUES IN MFD AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.

Westinghouse Chassis V-2240-1

Schematic Diagram Courtesy of Westinghouse Electric Corp.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 9 IN SET 263

Magnavox chassis CMUB422BC and CTB422BC (300 Series) were covered in Photofact Folder 9 – Set 263.

Chassis CMUB400CE, CMUB405CE, CMUB406CE, CMUB407CE, CMUB418CE, CMUB419CE, CMUB422CE, CMUB425CE, CMUB426CE, CMUB430CE, CMUB431CE, CTB400CE, CTB405CE, CTB406CE, CTB407CE, CTB418CE, CTB419CE, CTB422CE, CTB425CE, CTB426CE, CTB430CE and CTB431CE are electrically identical except for the following changes:

NEW TUNER

The UHF tuner used in the above chassis is part #700459. A schematic of this tuner is shown in Fig. 1.

The VHF tuner incorporated in the above chassis is part #700458. A schematic of this tuner is shown in Fig. 1.

COMPONENT CHANGES

R43 is decreased from 56Ω to 47Ω.

R46 is increased from 8.2KΩ to 15KΩ.

C51 is decreased from 10,000MMF to 680MMF.

R62 is increased from 15KΩ to 100KΩ.

C2D and C4 is replaced by a 100MFD, 350 volt capacitor (part #270021-55).

A 1000MMF added from pin 8 of V21 to ground.

R76 is increased from 20KΩ to 22KΩ.

C62 is replaced by a single 5000MMF capacitor.

C64 is increased from 1500MMFto 5000MMF.

R81 is increased from 68KΩ to 180KΩ.

C2B and R83 are omitted.

R91 is decreased from 4.7Meg to 470KΩ.

C73 is increased from 2400MMF to 2700MMF.

R95 is increased from 10KΩ to 12KΩ.

R94 is decreased from 1.8Meg to 1.2Meg.

A 1.5Meg resistor and a 950KΩ temperature compensating resistor (part #230130-1) are connected in parallel and added from R94 to the junction of R92, R115 and C3.

C2A is increased from 20MFD to 30MFD.

R109 is decreased from 1.5KΩ to 1000Ω.

R123 and R123 are replaced by a single 120KΩ resistor.

C94 is omitted.

The first video IF input circuit is revised. A partial schematic showing the new arrangement is given in Fig. 2.

The brightness control (R2) is changed to part #220129-3.

The vertical hold control (R3) is changed to part #220129-5. Listed on page 3 is the replacement data on both controls.

MAGNAVOX CHASSIS CMUB400CE, CMUB405CE, CMUB406CE, CMUB407CE, CMUB418CE, CMUB419CE, CMUB422CE, CMUB425CE, CMUB426CE, CMUB430CE, CMUB431CE, CTB400CE, CTB405CE, CTB406CE, CTB407CE, CTB418CE, CTB419CE, CTB422CE, CTB425CE, CTB426CE, CTB430CE, CTB431CE

PRODUCTION CHANGES
BULLETIN 152

PRODUCTION CHANGES
BULLETIN 152

PROPERTY OF
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HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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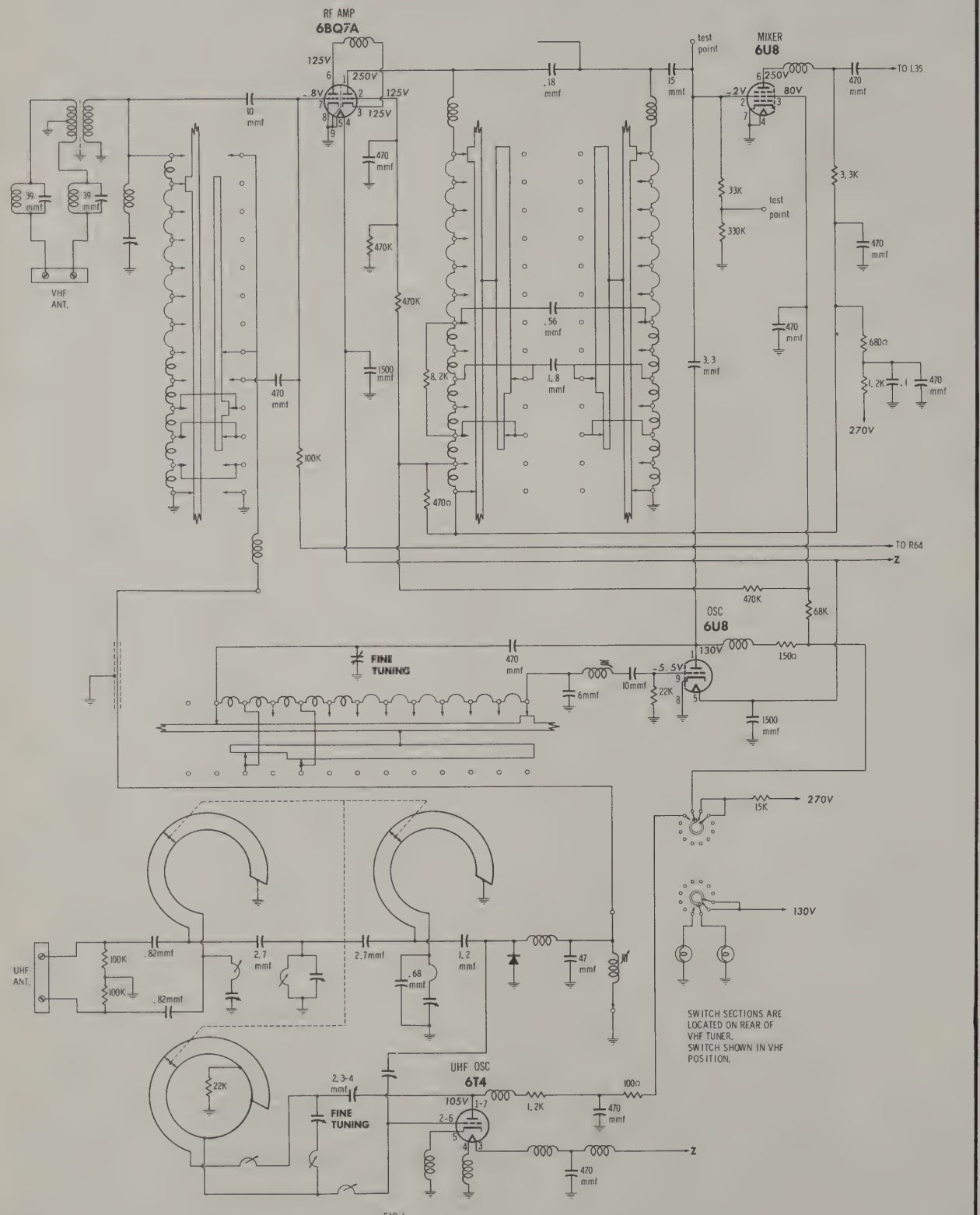

RF AMP
6BQ7A
MIXER
6U8
test point
TO L35
VHF ANT.
TO R64
OSC
6U8
FINE TUNING
270V
130V
15K
UHF ANT.
UHF OSC
6T4
FINE TUNING
SWITCH SECTIONS ARE LOCATED ON REAR OF VHF TUNER. SWITCH SHOWN IN VHF POSITION.

FIG. 1

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R2A	50KΩ	½	220129-3	AB-31	A47-50K-S	Q11-123	U-35	Brightness
B	Shaft		Not Req.	AK-8 ①	RS-3/16 ①	VQ	DS-37 ①	Attach to R2A
R3A	1.25Meg	½	220129-5	AB-742	A47-1.5Meg-S	Q11-138	U-155	Vert. Hold
B	Shaft		Not Req.	AK-8 ①	RS-3/16 ①	VQ	DS-37 ①	Attach to R3A

① Fashion replacement shaft to duplicate original.

The horizontal output transformer has been changed to part #360604-1. Replacement transformers and correct terminal connection data are given in this bulletin.

HALLDORSON	MERIT	RCA	RAM	STANCOR	THORDARSON	TRIAD
FB414 * & RF800	HV0-9 * & MWC-1	232T1 *	X098 *	A-8220 *	FLY-28 *	D-35 *

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	1	2	9	10	1	5	1	10
	3	8	7	8	3	2	3	8
	T	7	See Note ③	See Note ③	T	6	T	See Note ③
	4	6	1	3	4	1	4	3
	5	Term #1 of RF800	Red Term of MWC-1	2	5	8	5	2
	7	Term #2 of RF800	Blue Term of MWC-1	1	7	7	7	1
Connect Width Coil Across →	5 & 7	Terms #3 & #4 of RF800 across 5 & 6	Orange & Black terms of MWC-1 across 3 & 1	2 & 1	5 & 7	7 & 8	5 & 7	2 & 1
Special Notes →		④	③④	③				③⑤

① Fabricate new mounting plate.
② Drill new mounting holes.
③ Connect a 47MMF or 56MMF capacitor from open end of R116 (original terminal "T" connection) to terminal #3 of yoke (red lead).
④ Remove original width coil and jumper R117. If the picture is out of phase, reverse primary or secondary of replacement width coil.
⑤ Jumper terminals #9 and "T".

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 276

CHEVROLET MODEL 987364

Chevrolet model 987086 was covered in Photofact Folder 3 — Set 276.

Model 987364 (for all 1956 Chevrolet cars) is electrically identical except for the following changes.

V3 is changed from a 12BA6 to 12AU6.

C7 is decreased from 260MMF to 250MMF.

R10 is increased from 150Ω to 270Ω.

R29 is decreased from 910Ω to 750Ω.

R26 is decreased from 100KΩ to 33KΩ.

R30 may be two 330KΩ resistor connected in parallel.

R30 is omitted in some models.

Spark Plate Cap Assembly changed to part #1220885.

Solenoid and Plunger Assembly changed to part #7267048.

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 3 IN SET 278

CHEVROLET MODEL 987366

Chevrolet model 987088 was covered in Photofact Folder 3 — Set 278.

Model 987366 (for all 1956 Chevrolet cars) is electrically identical except for the following changes.

V3 changed from a 12BA6 to a 12AU6.

L8, filament hash choke changed to part #7265568.

C13 is decreased from .5MFD to .47MFD.

R8 is increased from 150Ω to 220Ω.

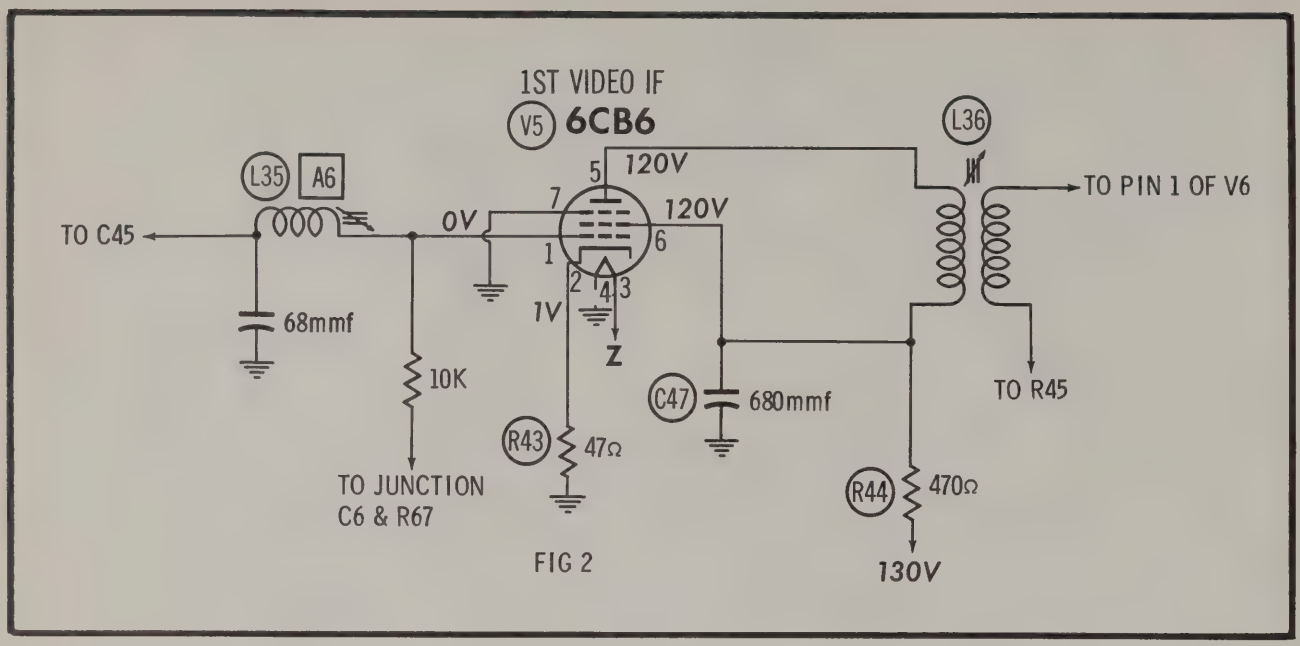
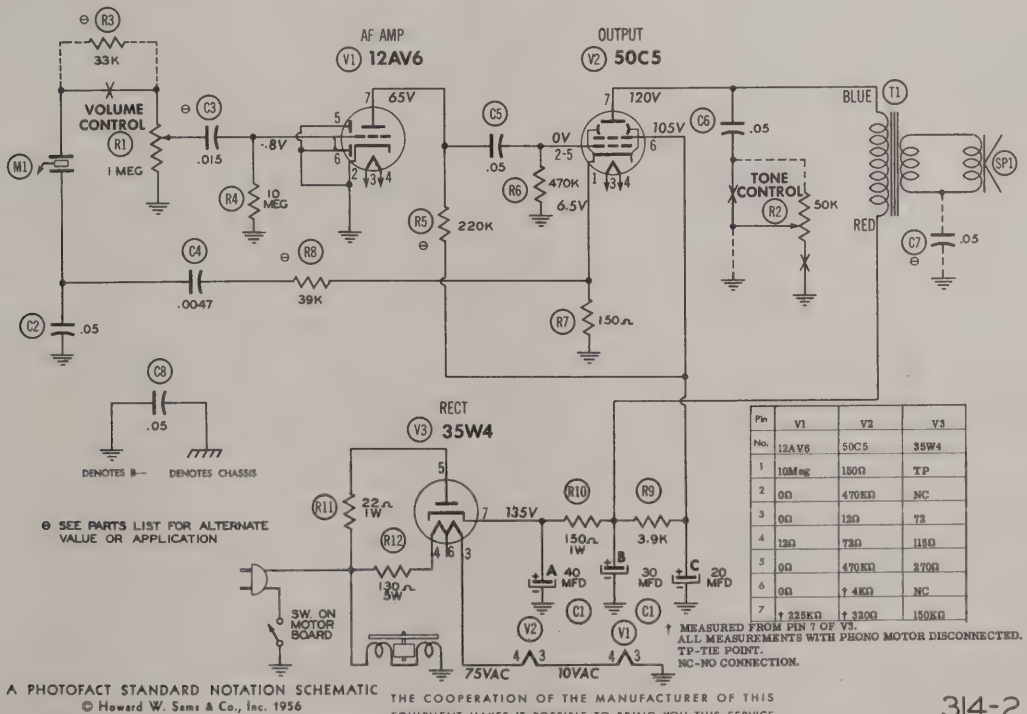

1ST VIDEO IF
V5 6CB6
L35
A6
TO C45
68mmf
0V
10K
TO JUNCTION
C6 & R67
5
7
6
1
2
4
3
120V
120V
1V
Z
R43
47Ω
C47
680mmf
L36
TO PIN 1 OF V6
TO R45
R44
470Ω
130V

FIG 2

COLUMBIA RECORDS
MODEL 316

TRADE NAME	Columbia Records Model 316
MANUFACTURER	Columbia Records, 799 Seventh Ave., New York 19, N. Y.
TYPE SET	AC Operated Phono Amplifier with 3 Speed Automatic Record Changer
TUBES (Three)	Types 12AV6 AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-60 Cycles
RATING	.22 Amp. @ 117 Volts AC

FOR SERVICE INFORMATION ON RECORD CHANGER-SEE COLUMBIA RECORDS MODEL 950-274; PHOTOFACT SET #276-FOLDER #4



Pin No.	V1	V2	V3
1	10Meg	150Ω	TP
2	0Ω	470KΩ	NC
3	0Ω	12Ω	73
4	12Ω	73Ω	115Ω
5	0Ω	470KΩ	270Ω
6	0Ω	† 4KΩ	NC
7	† 225KΩ	† 320Ω	150KΩ

† MEASURED FROM PIN 7 OF V3.
ALL MEASUREMENTS WITH PHONO MOTOR DISCONNECTED.
TP-TIE POINT.
NC-NO CONNECTION.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

314-2

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		Columbia Records PART No.	STANDARD REPLACEMENT	
V1	AF Amplifier	12AV6	12AV6	
V2	Output	50C5	50C5	
V3	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Columbia Records PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	150			BBRT43215		TML304020-150	CST-524	
B	30	150							
C	20	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Columbia Records PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400		BPD-05	DF-503	CUB4S5		PT415	2TM-S5	
C3	.015	600		BPD-015	DD16-153	CUB6S15	821-015	PT6115	6TM-S15	Note 1
C4	.0047	600		SI4700	D6-472	CUB6D15	811-0047	PT6247	6TM-D47	
C5	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C6	.05	200		BPD-05	DF-503	CUB2S5		PT415	2TM-S5	
C7	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	Note 2
C8	.05	400		BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

Note 1. Some versions may use a .01MFD capacitor in this application.
Note 2. Not used in all versions.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Columbia Records PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½	BA011-1250	AB-69	A47-1Meg-S	Q11-137	U-54	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
R2A	50KΩ	½	BA011-1449	AB-31	A47-50K-S	Q11-123	U-35	Tone
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R3	33KΩ	½		BTS-33K	Note 1
R4	10Meg	½		BTS-10Meg	
R5	220KΩ	½		BTS-220K	Note 2
R6	470KΩ	½		BTS-470K	
R7	150Ω	½		BTS-150	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Columbia Records PART No.	IRC PART No.	
R8	39KΩ	½		BTS-39K	Note 3
R9	3900Ω	½		BTS-3900	
R10	150Ω	1			
R11	22Ω	½			
R12	130Ω	5			

Note 1. Not used in some versions.
Note 2. Some versions may use a 270KΩ resistor in this application.
Note 3. Some versions may use a 47KΩ resistor in this application.

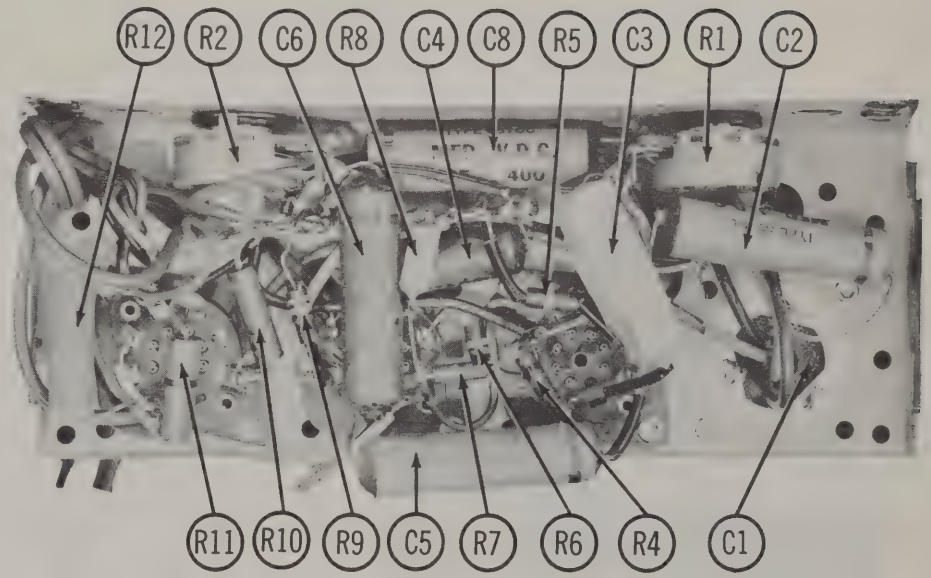
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Columbia Records PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3.6Ω	CS-525	Z1101	A-3025	A-3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Columbia Records PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"	PM	3.6Ω	CS-500	5A1	228S1	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA					REMARKS
	Columbia Records PART No.	ASTATIC PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		92-TB	K-1 and K-3	46T	0-1 or S-1 and 0-3	

ASTATIC AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	Columbia Records PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2		† CR-55 or ♦ CR-55D and † CR-55LP or ♦ CR-55LPD	† A-448 or ♦ A-448D and † C-449 or ♦ C-449D	† W-64S and † W-64MGS	† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	Columbia Records PART No.	NOTES
	Cabinet	CS-530	Includes Lid and Motor Board
	Knob	CS-522	Control-2 Used
	Grille	CS-524	

CONTINENTAL
MODEL 220

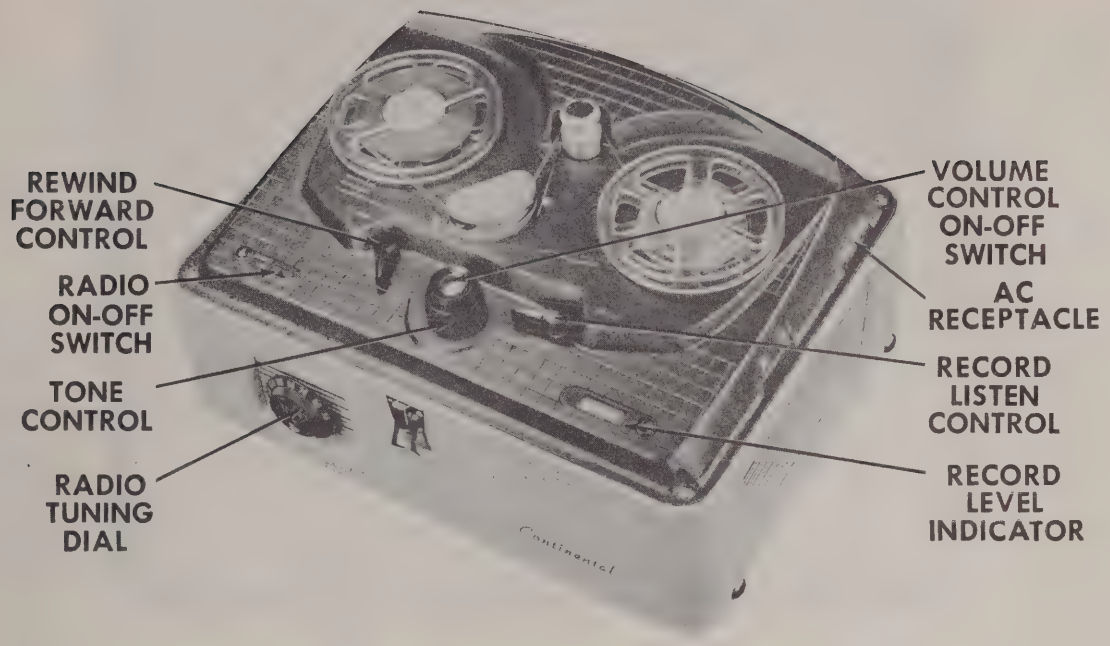


Figure 1

GENERAL INFORMATION

The Continental Model 220 is designed for twin-track two speed operation. The operating speeds are either 7 1/2 or 3 3/4 inches per second. The Continental is designed to record and play back two tracks of material on standard width recording tape, which doubles the playing time with no loss of frequency response or quality. Recordings can be made from a radio, television receiver or phonograph, in addition to those made directly from the microphone. Recordings can be played back through the self contained speaker, external speaker or through a high fidelity amplifier system.

This Continental is equipped with a dual speed capstan. When the capstan sleeve is in position over the capstan, the tape speed is 7.5 inches per second and with the sleeve removed, a tape speed of 3.75 inches per second will be obtained.

Using both channels of the tape, the recording time is as follows:

Size	Speed 3 3/4"	Speed 7 1/2"
5"	1 hour	1/2 hour
7"	2 hours	1 hour

Connect this recorder only to an outlet supplying 117 volts, 60-cycle, AC supply.

Manufactured by:

Tape Recorders, Inc.
1501 West Congress Street
Chicago, Illinois

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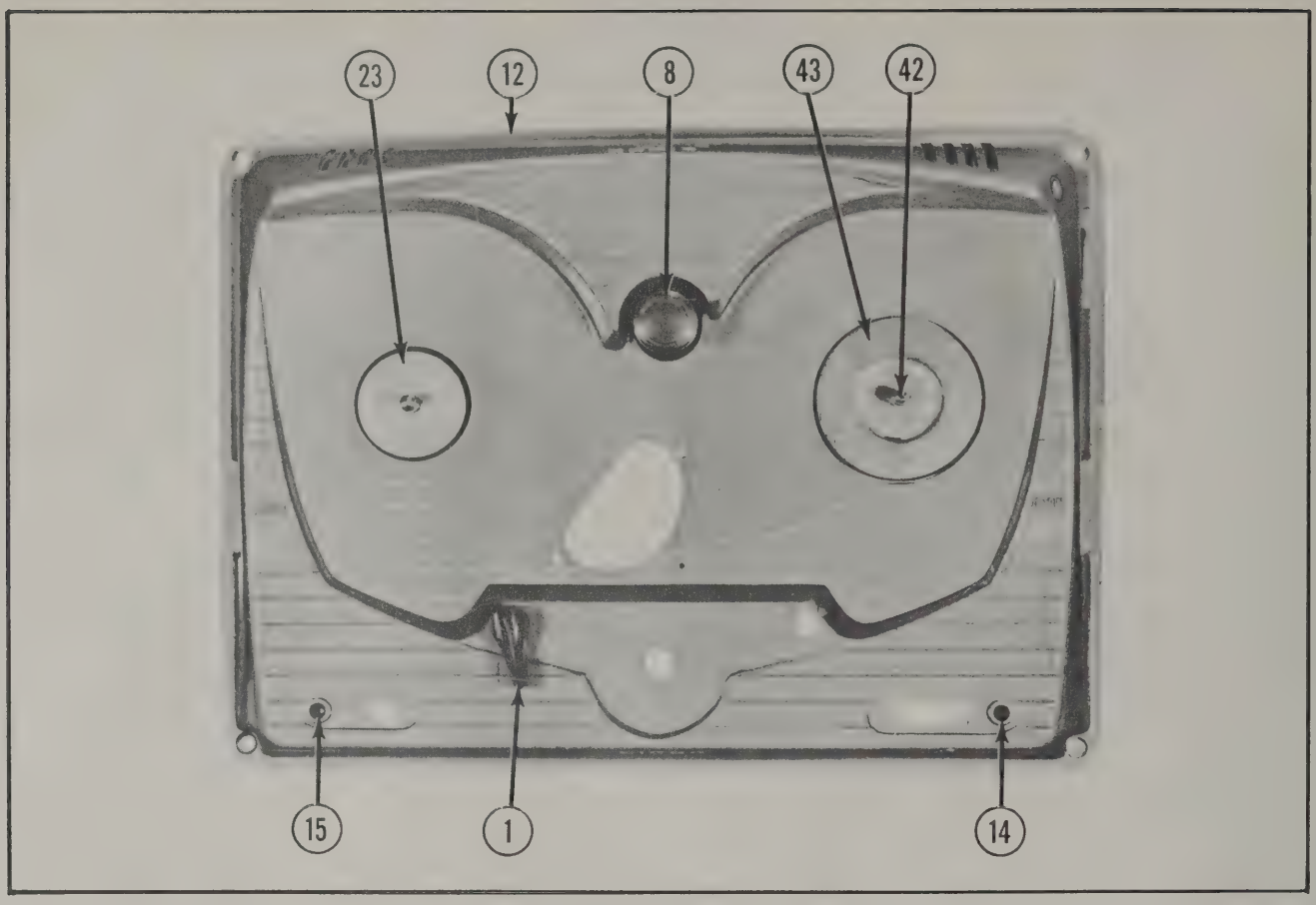


Figure 2

OPERATING CONTROLS

To Start-

Turn volume control knob (9) clockwise.

Volume-

Degree of rotation of volume control knob (9) determines volume of recording and playback.

Tape Travel-

Rewind-Stop-Forward control knob (1) controls direction of tape travel. Always return this knob to "Stop" position before turning unit off.

Record-Listen-

Record-Listen control knob (11) controls amplifier and record playback head. To prevent accidental erasure, place in "Listen" position immediately after recording is completed.

OPERATING INSTRUCTIONS

1. Insert the AC power cord into the receptacle on the rear of the case.

2. Plug the AC cord into a convenient wall receptacle of the proper rating.

Threading The Tape-

1. Place a reel of tape (either 5" or 7") on the left spindle (23) and an empty reel on the right spindle (43) making sure the reel slots engage the reel pin on the spindle.

2. Thread the tape by following the solid printed line on the top panel (Figure 2).

NOTE: This recorder uses type "A" wound tape, i. e. the dull magnetic coated side faces inward on the reel. If the tape used is type "B" (coated side facing outward) the recording will be made at a very low sound level and the playback will be almost inaudible.

3. Insert the free end of the tape through to the hub of the right reel and place a pencil firmly over the tape, forcing it into one of the three radial slots. Turn the reel several turns (counterclockwise) with the pencil in this position until the tape is secured to the reel and all slack is taken up between reels.

To Record From Microphone-

1. Turn the volume control knob (9) to the right until a click is heard and allow about thirty seconds for the tubes to warm up.

2. Insert microphone plug into input socket labeled "Microphone".

3. Turn record-listen knob (11) to "Record" position. When in this position, all material already on the tape will be erased before a new recording is made.

4. While talking into the microphone, adjust the volume control until the neon indicator light flashes

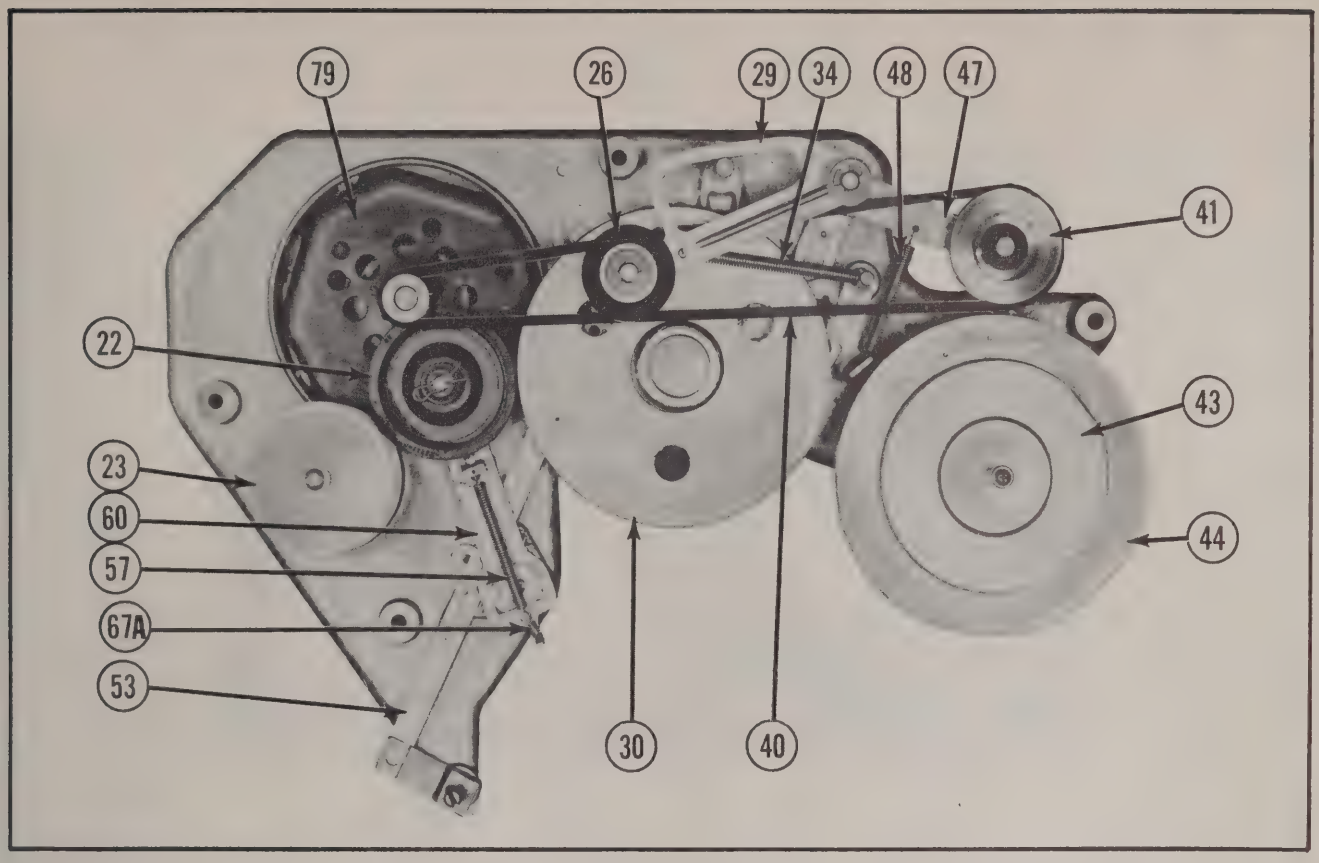


Figure 3

NOTE: Correct recording volume is very important. Too weak a signal, which does not cause the neon indicator to flash, will result in weak playback and high background noise. Too strong a signal, causing the indicator to flash constantly, will result in distortion during playback.

5. Turn the rewind-stop-forward control knob (1) to "Forward" position. The tape is now moving and any sound entering the microphone will be recorded on the tape.

To Record From Built-In Radio-

The built-in radio can be used in the following manner:

1. Turn the "On-Off" switch to the "On" position.

2. The "record-listen" switch should be in the "listen" position. (The green light will be on).

3. Then simply tune in any station you want using the tuning dial on the front of cabinet.

4. If the program comes on which you wish to record, simply move the record listen switch to the "record" position (the red light will go on) and move the "forward-rewind" switch to "forward" and you will be recording the program.

5. Make sure the volume control is adjusted to the point where the neon indicator just flickers on the louder notes.

To Change Speed-

The conversion to 3 3/4 inches per second from 7 1/2 inches per second speed is accomplished in the following manner.

1. Remove the larger diameter capstan (8) by lifting straight up and off.

2. By removing the larger capstan you leave the steel shaft of the capstan drum assembly (30) which is used for the speed of 3 3/4 inches per second.

3. To change back to 7 1/2 inches per second reverse the above procedure.

NOTE: Be sure when replacing larger capstan, that the pin inside properly engages the slot in the smaller capstan. If not in place properly variable speeds will result.

To Record From Phonograph-

1. Connect the cord clips of the attachment cord to the pickup leads on the phonograph.

2. Insert the attachment cord plug into the input socket labeled "Radio".

3. Proceed as described in "To Record From Microphone".

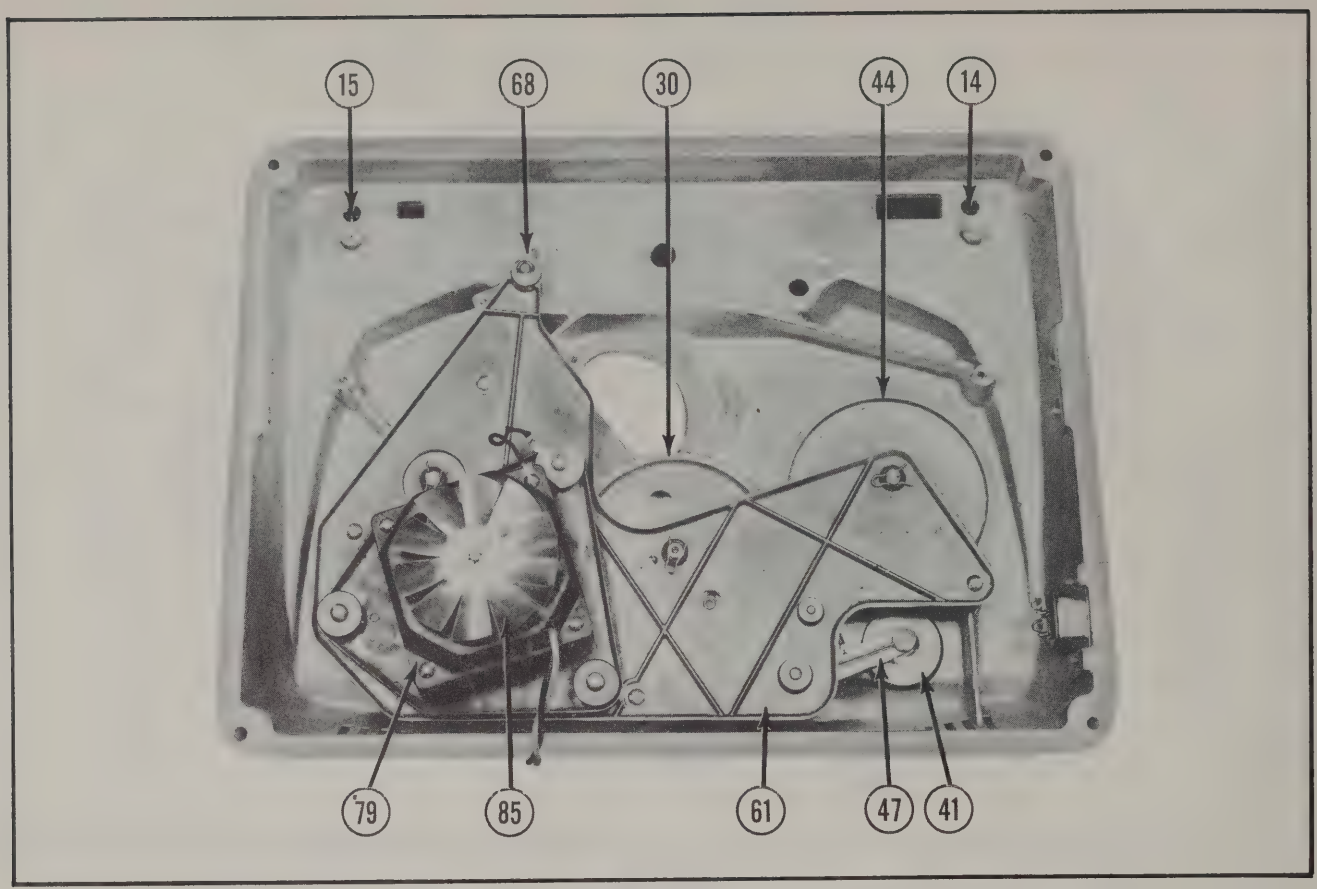


Figure 4

NOTE: Should a hum develop from the above connection, reverse the cord clips on the pickup leads.

To Record From Television Receiver-

1. Connect attachment cord as described in "To Record From Radio" and proceed with recording as described in "To Record From Microphone".

Dual Track Recording-

This recorder is designed so that 1/2 the tape width is recorded at a time; thereby resulting in two track recordings. This two track operation is accomplished in the following manner:

1. After a reel of tape has been recorded; i.e., all the tape wound on the right reel, place the rewind-stop-forward control knob (1) in the "Stop" position. This stops all movement of the tape.

2. Remove the reels from the recorder, turning the full reel over and placing it on the left spindle.

3. Properly thread the tape and proceed with the recording.

4. After the second track has been recorded the first track of recording is ready to be played, without rewinding, by reversing the reels as described in Step No. 2 above.

To Rewind-

1. With the volume control knob (9) turned on, turn the record-listen control knob (11) to "Listen"

2. Turn the rewind-forward control knob (1) to "Rewind" position. As the tape is rewinding you will hear the recording played backwards at a high rate of speed. When this sound stops, you have come to the start of the recording. To rewind a full reel of tape remove the tape from between the pressure roller (26) and capstan so the tape will rewind directly across the recorder to the left-hand reel; it will just touch the bottom of the recording head. This method is faster when rewinding an entire reel and reduces recording head wear.

To Play A Recording-

1. Thread the tape as described under "Threading The Tape".

2. Turn the On-Off-Volume control knob (9) on and allow approximately thirty seconds for the tubes to warm up.

3. Place the record-listen control knob (11) in the "Listen" position.

4. Place the rewind-stop-forward control knob (1) in the "Forward" position and adjust the volume control for desired level.

To Use An External Speaker-

Any size speaker of the permanent magnet type, having a 3.2Ω voice coil, may be used by connecting the attachment cord across the voice coil terminals of the speaker and then inserting the plug into the output socket labeled "Radio Speaker".

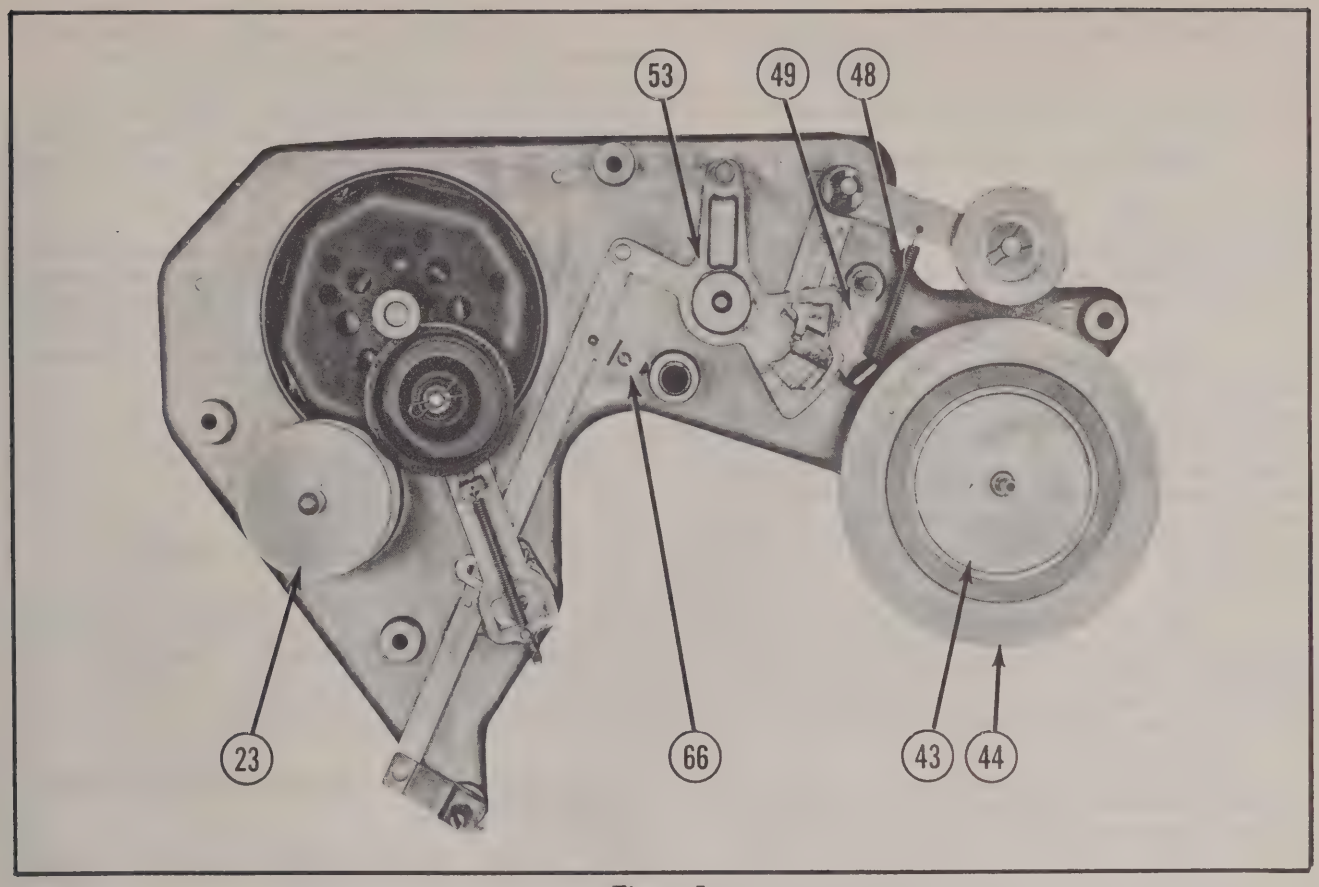


Figure 5

To Edit And Splice Tape-

NOTE: Since it is impossible to edit and splice one track without affecting the other, recordings which are to be edited should be limited to one track only.

1. The tape may be edited by cutting out unwanted portions, or by joining selection into another sequence. Announcements may be inserted between selections, etc. Unused sections of tape can be spliced together for re-use.

2. For best results, cut tape at a slight diagonal, join ends together with splicing tape on the glossy side and trim off any excess width.

Erasing Recorded Material-

It is not necessary to first erase a recorded tape if the same tape is to be used for a new recording. Erasing of recorded material takes place automatically when new material is recorded. If it is desired only to erase a tape, set the machine for recording without having the microphone or attachment cord connected to input jack.

DISASSEMBLY INSTRUCTIONS

To remove the recorder from its cabinet, remove the four phillips head screws (13) from the corners of the top panel (12). Insert a thin-blade screwdriver between the panel and the cabinet and pry upwards enough to slip the finger under the panel. Lift up enough to permit the speaker plug and AC leads, etc., to be disconnected. The recorder can now be removed complete.

In handling the recorder out of its cabinet, care must be taken to avoid damage to the motor fan (85) and the motor shaft. When replacing the recorder, check to be sure the speaker leads and AC leads will not be pinched or will not interfere with the recorder mechanism.

INSPECTION OF COMPLETE RECORDER

1. Visually inspect the alignment of the cam on the "Forward-Stop-Rewind" shaft. The cam should close the erase interlock switch when in the "Forward" position.

2. Move the tape through the machine, first in the forward direction and then in the rewind direction. The tape should pass midway between the flanges of the reel which is receiving the tape. Change shims under the recording head, if necessary, to achieve this.

3. With the recorder out of the cabinet and the motor running, orient the power transformer of minimum audible hum from the speaker. Tighten the four transformer mounting screws.

4. When placing the recorder in the cabinet, check for bent fan and for paths of speaker leads, motor leads and AC leads which will not interfere with any moving part of the mechanism.

5. Using plastic base tape, make microphone voice recordings at various volume control settings, including a recording of loud talking close to the mike with the volume control at maximum gain. Upon playback, the best recording should be that made with the neon bulb flashing only on the louder syllables. Erase the portion of tape having overloaded recording. No trace of the recording should remain.

6. Make a music recording from a disc or other source. Play back and listen for over-all quality.

7. Check for easy operations of controls.

MECHANICAL DRIVE ASSEMBLY

1. With the rewind-stop-forward control knob (1) in the "Stop" position, idler wheel 22 should be in a neutral position; that is, there should be a clearance of 1/32" between the motor shaft and the idler wheel.

2. With control knob (1) in the "Rewind" position, idler wheel (22) is pivoted against the rewind drum (23) and the motor shaft. This accounts for the fast rewind speed. Make a check, by turning the rewind drum (23) counterclockwise, to see if these parts contact each other properly. The idler wheel should turn the motor shaft. If this does not occur, check for binding parts, oil on the friction surfaces, or looseness of springs (57 and 67A).

3. When control knob (1) is in the "Forward" position, idler (22) is pivoted against the flywheel and capstan (30) and the "O" ring belt (40), which is driven by the motor belt pulley (16), is pivoted against the rim of the take-up drum (44).

4. With the motor running and control knob (1) in "Stop" position there should be at least 1/32" clearance between belt (40) and take-up drum (44).

5. With the motor running and control knob (1) in "Stop" position observe belt (40). The same portion of the belt surface should run in the pulley grooves at all times, that, the belt should not rotate above the center of a cross section. If such rotation does occur, belt pulley (16) is not correctly located.

6. Check end play of rewind drum (23), flywheel (30) and take-up drum (44). Each should have some end play, not more than 1/32". Correct assembly of washers on these shaft should control this.

7. With control knob (1) in "Rewind" position, there should be at least 1/32" clearance between the rubber on the brake (49) and the take-up drum (44). With motor running, move the control knob slowly from "Rewind" to "Stop". Meanwhile, rotate the take-up drum (44) manually. The brake should rotate the take-up drum before the rewind drum stops rotating. Bend the brake arm to meet these requirements.

8. Place a full 5" reel of tape on the take-up spindle (43) and run the machine in the "Forward" position. Measure the tension required to hold the tape reel stationary. This tension should be 1 to 2 ounces.

NOTE: This tension should be measured after the machine has been running with the clutch slipping for at least one minute. The tension is controlled by the type and amount of lubricant used on the felt washer.

9. Using a 7 inch reel of tape and an empty 7 inch reel, thread the tape as for playing and observe the passage of the tape between the reel flanges on forward drive and on rewind. The tape should be centered between the reel flanges, and the clearance between reel flanges and top plate should be ample without having interference around the entire reel perimeter, it will be necessary to replace defective parts.

10. When threaded as for playing, and when powered by 115 volts 60 cycles, the unit should start rewinding when switched from "Off" to "Rewind" with an almost full 7 inch reel on the rewind drum and only a dozen or so turns of tape on the take-up reel. Failure to start may be due to weak motor or friction in the bearings of the capstan or take-up drum.

11. Check functioning of pressure roller by holding clutch plate on take-up drum and letting tape run through capstan. If tape does not run through smoothly, check to see if pressure roller surface is clean. The shaft should be well oiled. The pressure roller in contact should be flush up against the capstan.

TROUBLES

Take-Up Drum And Capstan Speed Irregular-

1. Grease or oil on the rubber drive surface of idler wheel (22), motor shaft, pressure roller (26) "O" belt (40) and take-up drum (44). Clean these parts with naptha.

2. Motor belt pulley (16) loose.

Tape Overruns When Control Is Turned From "Rewind" To "Stop" Position-

1. Brake assembly (49) not adjusted properly. See "Mechanical Drive Assembly #7."

Tape Will Not Rewind-

1. Spring (57 and 67A) loose.

Failure To Erase-

1. Check head windings for open or shorted coils.

2. Check playing surfaces for dirt or other foreign material which would prevent close contact of the tape to the erase head surface.

3. Check position of head to be sure the tape is running over correct surfaces.

4. Check the head for excessive wear of the erase head surface.

5. Check the operation of the erase interlock switch.

Faulty Play-Back-

1. Same as above.

2. Check amplifier circuits, tubes, etc.

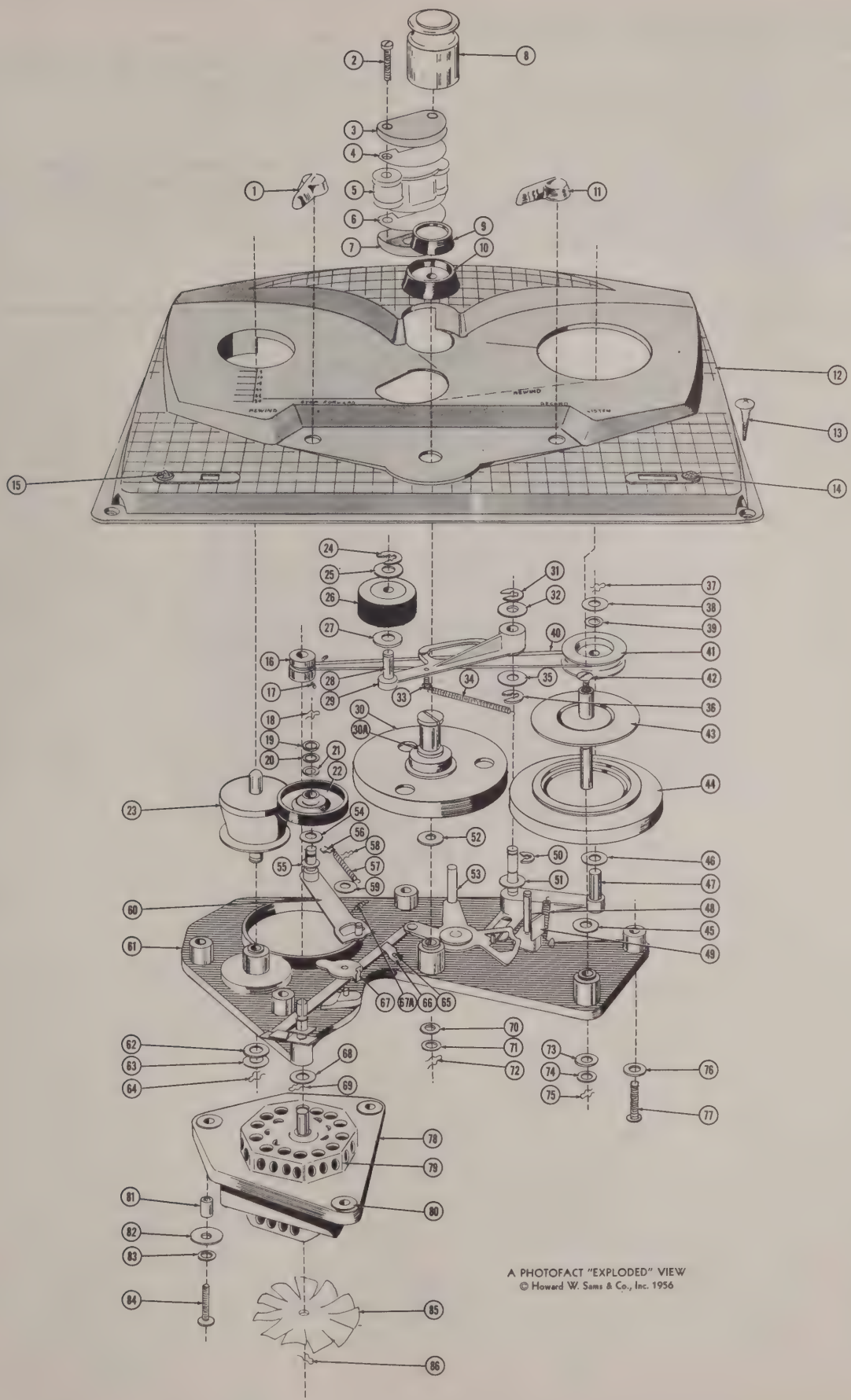
Wows-

1. Check capstan (30) for excessive runout.

2. Check idler (22) for worn or uneven surface.

3. Check for low line voltage.

4. Check for sticky tape or foreign material on the pick-up surface.



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5. Check the tape width and be sure that it is not binding in the guides.

6. Check for distorted reels or any other friction which might cause an excessive load on the motor or drive assembly.

7. Check pressure roller(26) for signs of foreign matter or excessive wear.

LUBRICATION

Extreme care should be taken when lubricating the mechanism. For satisfactory operation, the instructions in this section should be followed.

1. Mechanical linkages should be lubricated lightly at points of friction with Sta-Put No. 18-H.

2. The shafts of rotating parts, when replaced should be wiped clean with a lint-free cloth or paper and oiled lightly with Kensington No. 9 Spindle Oil. Use two or three drops.

3. When lubricating the felt washers on the take-up and rewind drum, use Sta-Put Oil No. 360 Saturate the felt washers and then remove as much of the oil as possible by pressing a cloth or absorbent paper against them.

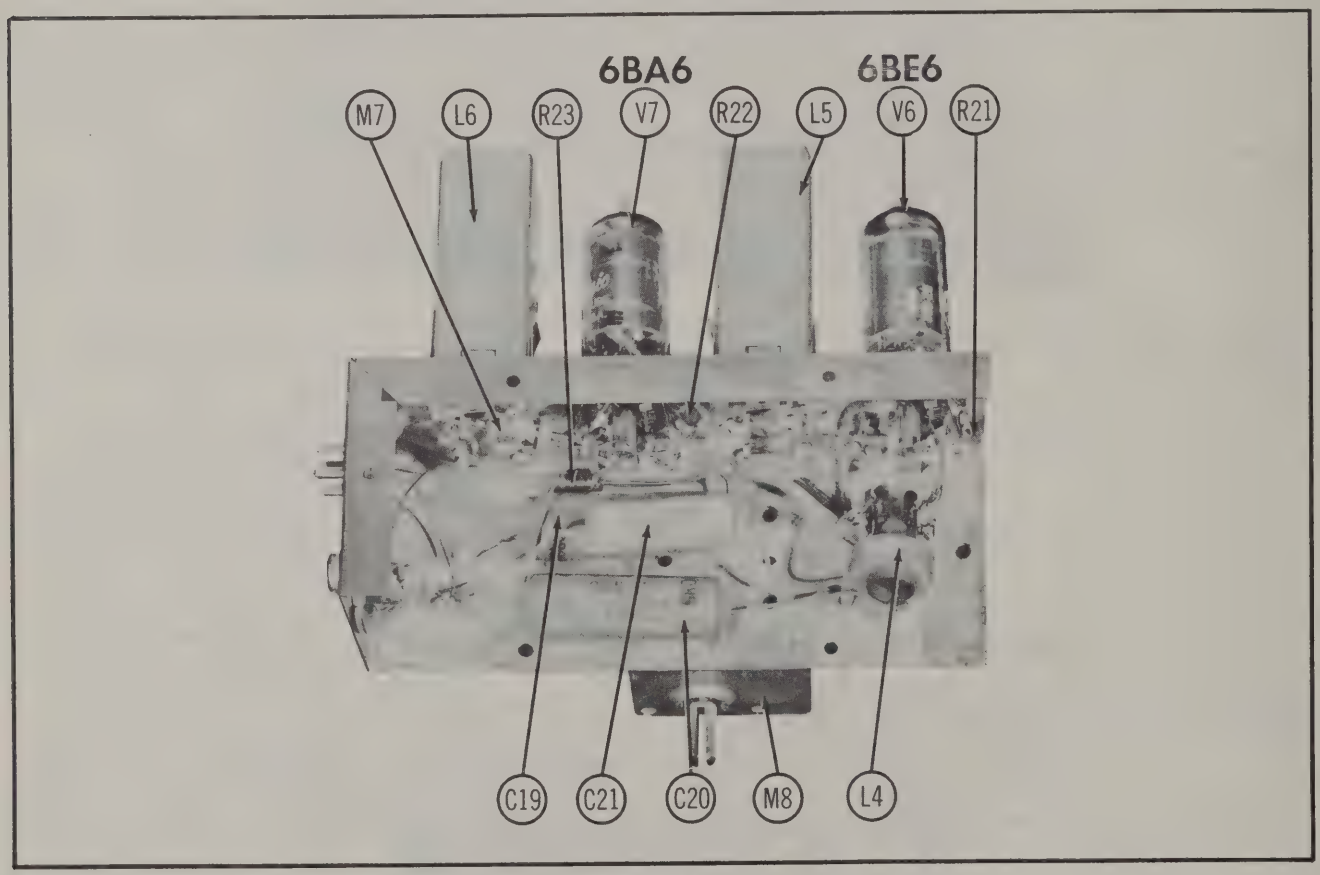
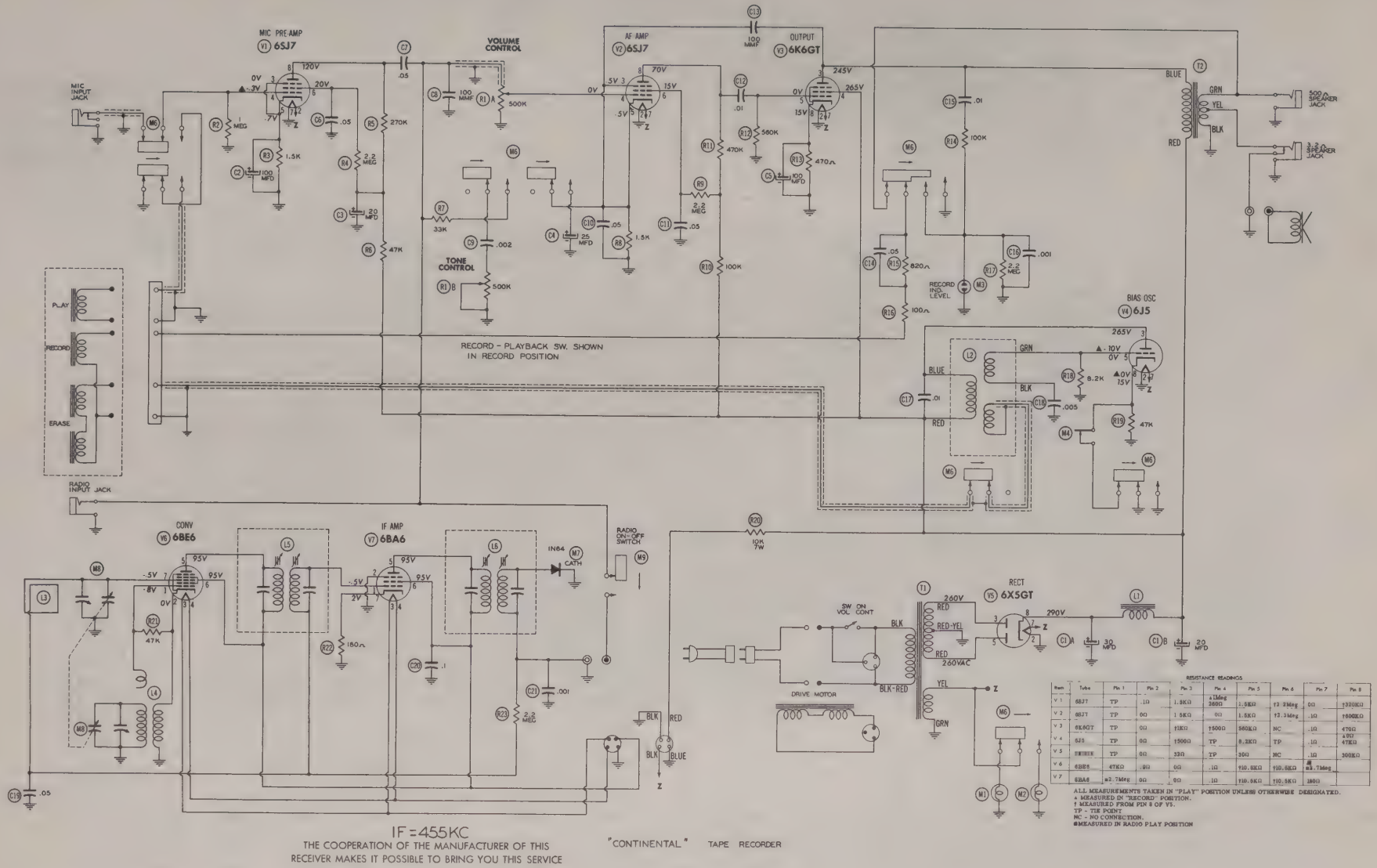


Figure 6



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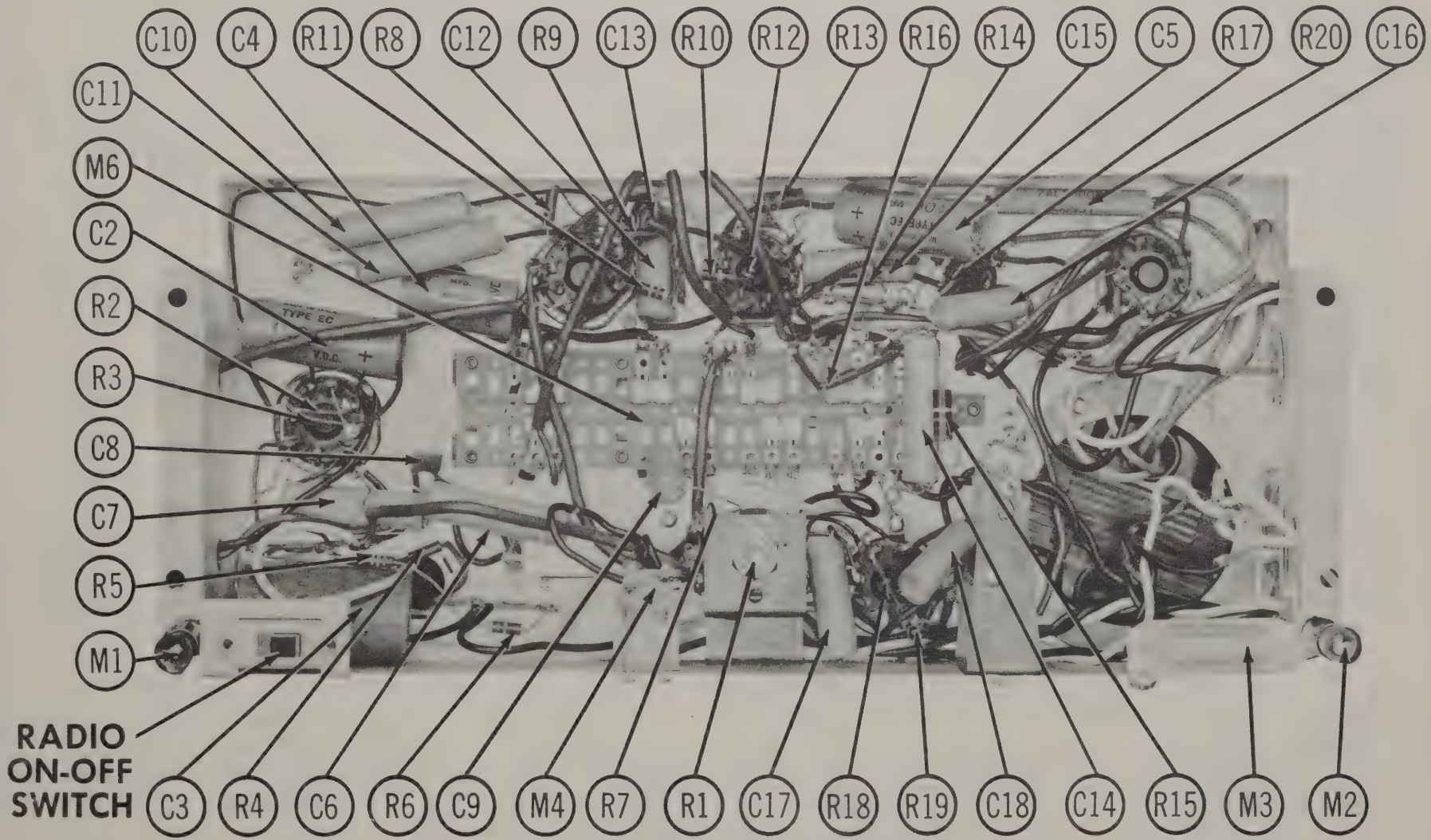
314-3

CONTINENTAL
MODEL 220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R8
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R9
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C11
M6
C2
R2
R3
C8
C7
R5
M1
RADIO
ON-OFF
SWITCH
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Figure 7

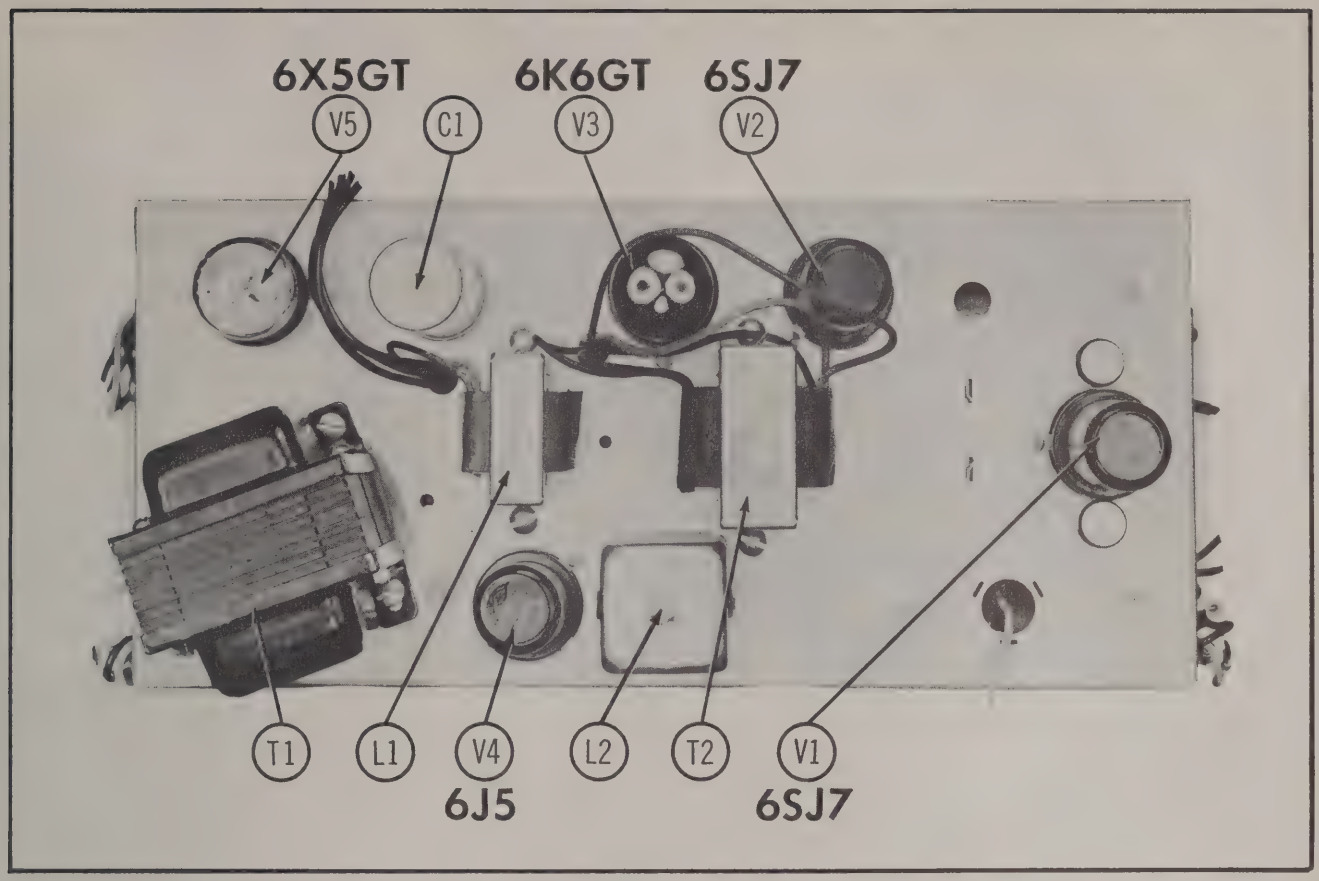

Figure 8

MECHANICAL PARTS LIST

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
1	TR-101-4119	Rewind-Stop-Forward Control Knob	30	TR-301-2163	Capstan Drum Assembly
			30A	TR-301-2173	#9 "O" Ring
2	TR-101-7031	Phillips Round Head Screw, 6-32	31	TR-301-2170	"C" Washer
			32	TR-301-2184	Bakelite Washer
3	TR-101-1016A	Upper Head Shield	33	TR-301-2180	No. 6 Self Tapping Screw
4	TR-101-1027	.010" Shield	34	TR-101-4092	Pressure Roller Arm Spring
5	TR-301-1062	Head Assembly (cartridge only)	35	TR-301-2184	Bakelite Washer
			36	TR-301-2170	"C" Washer
6	TR-101-1027	.010" Shield	37	TR-101-2072	Spring Retainer
7	TR-301-1065A	Lower Head Shield	38	TR-301-2184	Bakelite Washer
8	TR-301-2199	Capstan Head & Button Asm.	39	TR-101-2012	Felt Washer
9	TR-301-4280	Volume Control Knob	40	TR-101-2002	"O" Ring Belt
10	TR-301-4195A	Tone Control Knob	41	TR-101-2081	Belt Pulley & Bushing Asm.
11	TR-101-4119	Record-Listen Control Knob	42	TR-101-7005	Binder Head Machine Screw, 4-40 x 3/16
12	TR-301-4196A	Top Plate			
13	TR-101-7010	Phillips Head Wood Screw 10 x 1 1/4	43	TR-101-2079	Tape Disc Assembly
			44	TR-301-2194	Take-Up Drum Assembly
14	TR-301-4202	Indicator Plug Button (red)	45	TR-301-2185	Bakelite Washer
15	TR-301-4201	Indicator Plug Button (green)	46	TR-301-2184	Bakelite Washer
16	TR-101-2033	Motor Belt Pulley	47	TR-101-2080	Belt Pulley Lever & Bushing Asm.
17	TR-101-7004	Allen Set Screw, 6-32			
18	TR-101-2073	Spring Retainer	48	TR-101-2101	Brake Drive Spring
19	TR-101-2044	Bakelite Washer	49	TR-101-2094	Brake Assembly
20	TR-101-2030	Felt Washer	50	TR-301-2170	"C" Washer
21	TR-101-2065	Fishpaper Washer	51	TR-101-2012	Felt Washer
22	TR-101-2003	Idler Wheel	52	TR-301-2185	Bakelite Washer
23	TR-301-2195	Rewind Drum Assembly	53	TR-301-2168	Control Link Assembly
24	TR-301-2170	"C" Washer	54	TR-101-2065	Fishpaper Washer
25	TR-301-2184	Bakelite Washer	55	TR-101-2044	Bakelite Washer
26	TR-301-2167A	Pressure Roller Assembly	56	TR-101-2042	Idler Lever Spring Clip
27	TR-301-2184	Bakelite Washer	57	TR-101-2038	Idler Lever Spring
28	TR-301-2179	Pressure Roller Shaft	58	TR-101-2071	Spring Retainer
29	TR-301-2177A	Pressure Roller Arm	59	TR-101-2031	Retainer Washer

MECHANICAL PART LIST - Con't

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
60	TR-101-2089	Idler Lever & Pin Assembly	75	TR-101-2073	Spring Retainer
61	TR-301-2182	Base & Bushing Assembly	76	TR-301-4216	Washer, No. 10
62	TR-101-2070	Felt Washer	77	TR-301-4214	Round Head Machine Screw, 10-32 x 5/16
63	TR-301-2185	Bakelite Washer			
64	TR-101-2073	Spring Retainer	78	TR-101-2086	Motor Mounting Plate (for Alliance motor)
65	TR-301-3184	Self Tapping Screw, No. 4			
66	TR-301-2189	Control Link Stop		TR-101-2134	Motor Mounting Plate (for Fasco motor)
67	TR-101-2043	Idler Cam			
67A	TR-101-2039	Idler Cam Spring	79	TR-101-1000	Motor (Alliance)
68	TR-301-2157	Control Switch Arm		TR-101-2136	Motor (Fasco)
69	TR-101-2073	Spring Retainer	80	TR-101-2001	Grommet
70	TR-101-2070	Felt Washer	81	TR-101-2006	Bushing
71	TR-301-2185	Bakelite Washer	82	TR-101-2150	Washer
72	TR-101-2073	Spring Retainer	83	TR-301-7002	Split Lockwasher, No. 10
73	TR-101-2070	Felt Washer	84	TR-101-7003	Round Head Machine Screw
74	TR-301-2185	Bakelite Washer	85	TR-101-2095	Fan
			86	TR-101-2073	Spring Retainer

ELECTRICAL PARTS LIST

Ref. No.	Description	Ref. No.	Description
V1	6SJ7, Mic. Pre-Amp.	R4	Resistor, 2.2 Meg. 1/2 Watt
V2	6SJ7, AF Amp.	R5	Resistor, 270K, 1/2 Watt
V3	6K6GT, Power Output	R6	Resistor, 47K, 1/2 Watt
V4	6J5, Bias Oscillator	R7	Resistor, 33K, 1/2 Watt
V5	6X5GT, Rectifier	R8	Resistor, 1.5K, 1/2 Watt
C1A	Electrolytic Cap. 30MFD. @ 350V.	R9	Resistor, 2.2 Meg., 1/2 Watt
C1B	Electrolytic Cap. 20MFD. @ 350V.	R10	Resistor, 100K, 1/2 Watt
C2	Electrolytic Cap. 100MFD. @ 25V.	R11	Resistor, 470K, 1/2 Watt
C3	Electrolytic Cap. 20MFD. @ 350V.	R12	Resistor, 560K, 1/2 Watt
C4	Electrolytic Cap. 25MFD. @ 25V.	R13	Resistor, 470Ω, 1/2 Watt
C5	Electrolytic Cap. 100MFD. @ 25V.	R14	Resistor, 100K, 1/2 Watt
C6	Capacitor, .05MFD. @ 400V.	R15	Resistor, 820Ω, 1 Watt
C7	Capacitor, .05MFD. @ 400V.	R16	Resistor, 100Ω, 1/2 Watt
C8	Capacitor, Ceramic, 100MMF.	R17	Resistor, 2.2 Meg., 1/2 Watt
C9	Capacitor, .002MFD. @ 600V.	R18	Resistor, 8.2K, 1/2 Watt
C10	Capacitor, .05MFD. @ 400V.	R19	Resistor, 4.7K, 1/2 Watt
C11	Capacitor, .05MFD. @ 400V.	R20	Resistor, 10K, 7 Watt
C12	Capacitor, .01MFD. @ 600V.	T1	Power Transformer
C13	Capacitor, Ceramic, 100MMF.	T2	Output Transformer
C14	Capacitor, .05MFD. @ 400V.	L1	Filter Choke
C15	Capacitor, .01MFD. @ 600V.	L2	Bias Osc. Coil
C16	Capacitor, .001MFD. @ 600V.	SP1	5" x 7" Oval Speaker, PM (3.2Ω)
C17	Capacitor, .01MFD. @ 600V.	M1	Pilot Light, Type TS51 (Record Indicator)
C18	Capacitor, .005MFD. @ 600V.	M2	Pilot Light, Type TS51 (Play Indicator)
R1A	Volume Control & Switch, 500K (Rear Section)	M3	Neon Lamp (Record Level Indicator)
R1B	Tone Control, 500K	M4	Switch, Erase Interlock
R2	Resistor, 1 Meg., 1/2 Watt	M5	Speed Equalization Switch
R3	Resistor, 1.5K, 1/2 Watt	M6	Play Record Switch

RADIO ELECTRICAL PARTS LIST

Ref. No.	Description	Ref. No.	Description
V6	6BE6, Converter	R23	Resistor, 2.2 Meg., 1/2 Watt
V7	6BA6, IF Amplifier	L3	Loop Antenna
C19	Capacitor, .05MFD. @ 400V.	L4	Oscillator Coil
C20	Capacitor, .1MFD. @ 200V.	L5	Input IF
C21	Capacitor, .001MFD. @ 600V.	L6	Output IF
R21	Resistor, 47K, 1/2 Watt	M7	Crystal IN64
R22	Resistor, 180Ω, 1/2 Watt	M8	2 Gang Variable Capacitor

PHOTOFACT* Folder

*TRADE MARK

RETMA MEMBER

FLEETWOOD MODEL 810

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TRADE NAME	Fleetwood Model 810
MANUFACTURER	Conrac, Inc., Glendora, California
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC
RATING	2.16 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13, Video IF 25.75MC, Sound IF 21.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 1
Horizontal Sweep Circuit Adjustments 16
Parts List and Descriptions 12, 13, 14
Photographs
- Capacitor Identification 3, 10
- Chassis-Rear View 16
- Chassis-Top View 11
- High Voltage Compartment 16
- RF Tuner 15

Photographs (Cont)
- Resistor Identification 4, 9
- Trans., Inductor & Alignment Identification 11

Resistance Measurements 8
Servicing in the Field 1
Schematic (Alternate Tuner) 7
Schematic (TV) 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

FLEETWOOD MODEL 810

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

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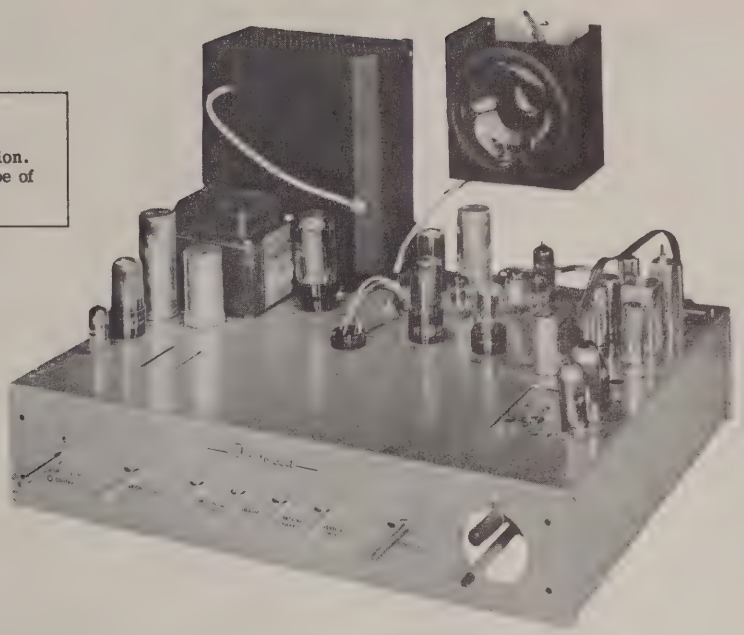
DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

This receiver is designed for custom installation. Chassis removal instructions will vary with type of mounting employed.



MODEL 810

FLEETWOOD
MODEL 810

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF Tuner Oscillator Circuit may be accomplished by removal of the Channel Selector and Fine Tuning knobs. The adjustments are accessible, one at a time, through the small hole in the cabinet to the right of the Channel Selector shaft.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to the chassis. Adjustment is located on top of the chassis. Set the horizontal hold control at the center of its range and adjust the horizontal oscillator slug (L23) until picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate Sound IF Detector Buzz, adjust the ratio detector secondary (L22) located on top of the chassis.

FUSES

One fuse is used for(L. V. Power Supply) protection. For location see Tube Placement Chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the P. M. Focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

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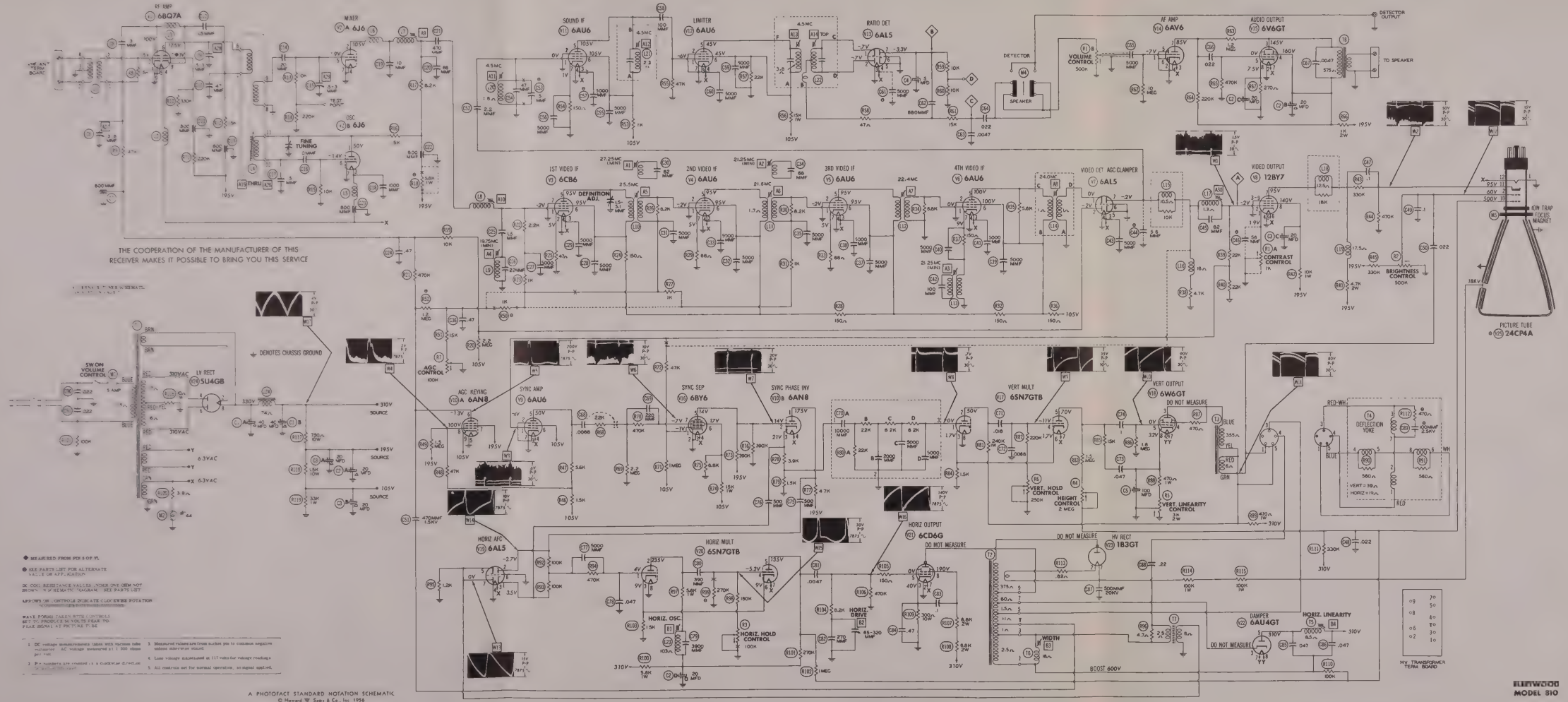
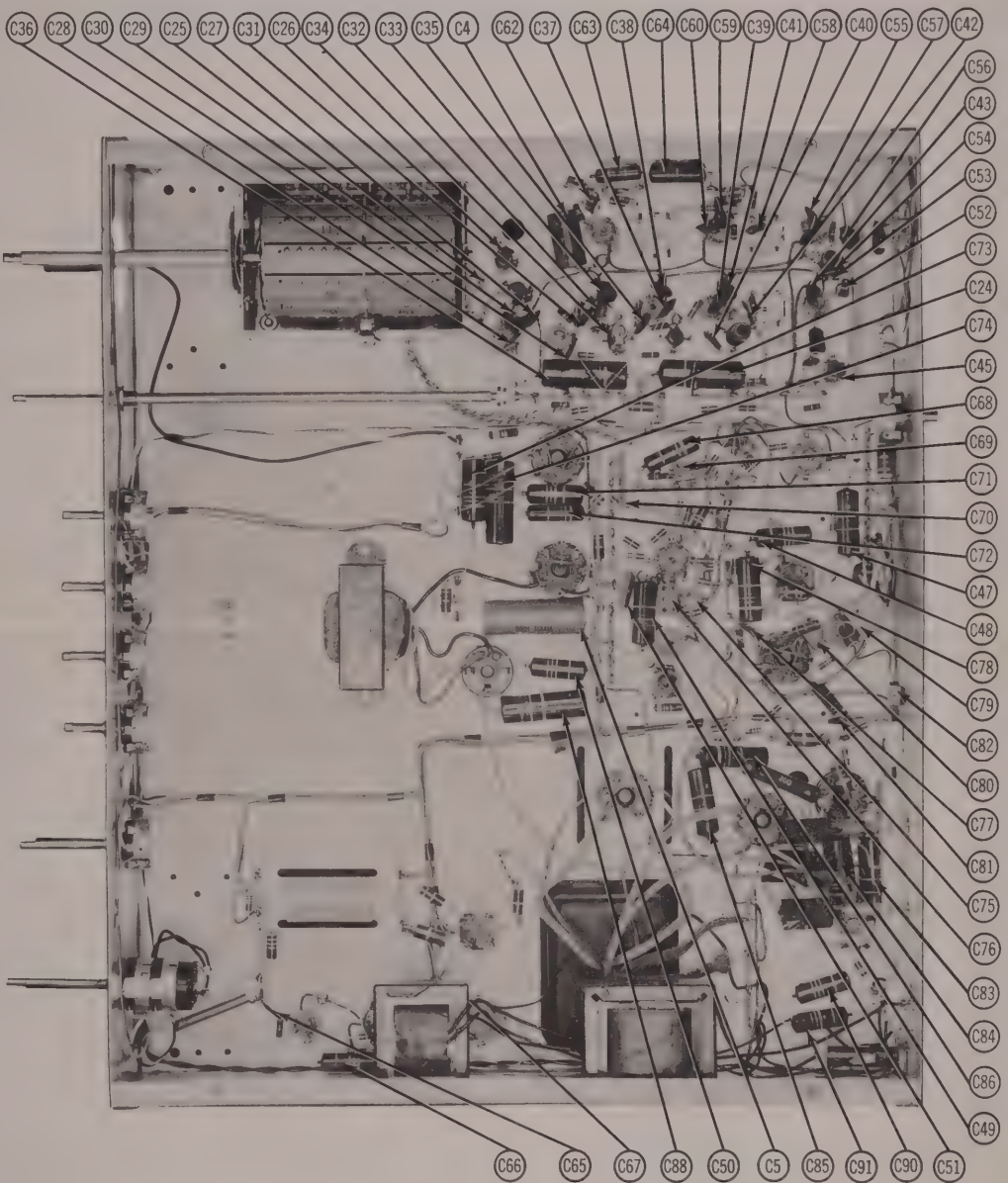
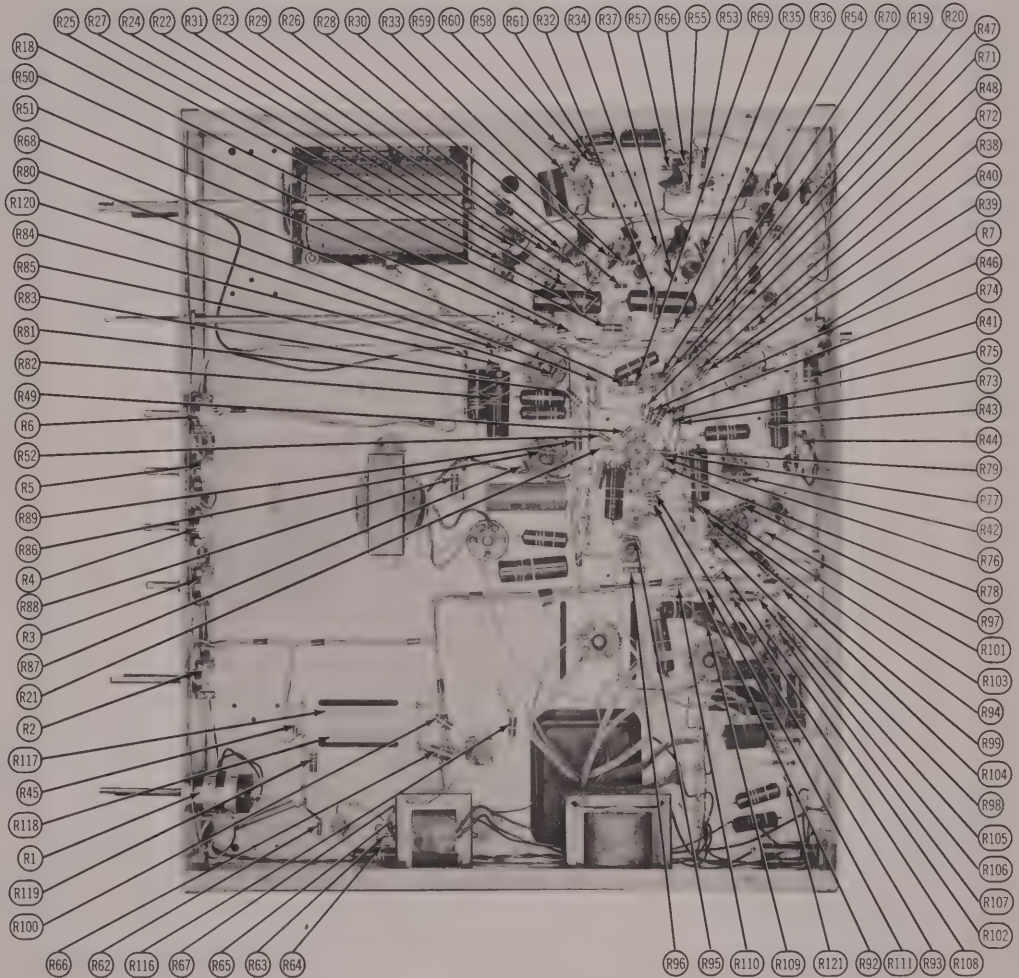

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1956
FLEETWOOD MODEL 810
FLEETWOOD MODEL 810



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

FLEETWOOD
MODEL 810

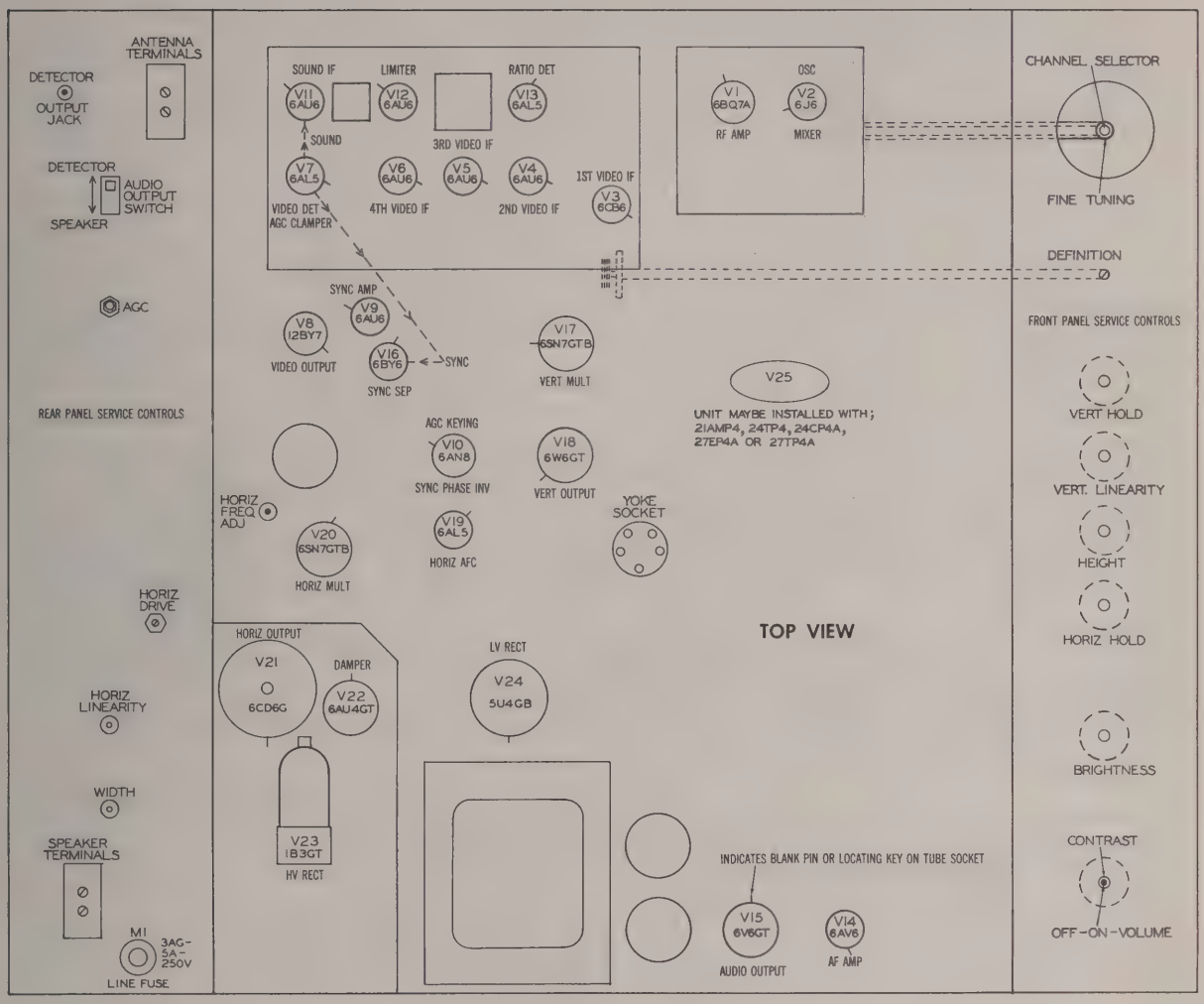


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

MODEL 810

FLEETWOOD

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V24, Fuse (M1)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6, V7**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V8, V10, V25**
Has pic, no sound - **V11, V12, V13, V14, V15**
Overloaded picture - **V7, V10**

SYNC FAILURE
No vert. sync - **V10, V17**
No horiz. sync - **V10, V19, V20**
No vert. or horiz. sync - **V9, V10, V16**

SWEEP FAILURE
No raster, has sound - **V20, V21, V22, V23, V25**
No vertical deflection - **V17, V18**
Poor vert. linearity or foldover - **V17, V18**
Poor horiz. linearity or foldover - **V20, V21, V22**
Narrow picture - **V20, V21, V22 , V23, V24**
Vert. off freq. - **V10, V17**
Horiz. off freq. - **V10, V19, V20**

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace with a 6J6 which has had pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt bias supply to the ungrounded side of C24. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	27.25MC (Unmod.)	Any	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.25MC	"	"	A2	"
3.	"	"	21.25MC	"	"	A3	"
4.	"	"	19.75MC	"	"	A4	"
5.	"	"	25.5MC	"	"	A5	Adjust for maximum deflection. Attenuate generator output to maintain not more than -1.5 volts on VTVM.
6.	"	"	21.6MC	"	"	A6	"
7.	"	"	22.4MC		"	A7	"
8.	"	"	24MC	"	"	A8	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24.0MC (10MC Swp.)	19.75MC 21.25MC 22.0MC 23.7MC 25.75MC 27.25MC	Any	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A9, A10	Check for response similar to Fig. 1. Adjust A9 until dip in response curve is centered about the 23.7MC marker. If necessary, retouch A5 thru A8 to obtain desired response. Adjust A10 for maximum amplitude.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (grid) of 6AU6 (V11). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point Ⓑ. Common to chassis.	A11, A12, A13	Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point Ⓒ. Common to point Ⓓ.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to pin 1 (grid) of 6AU6 (V11). Low side to chassis.	4.5MC (450KC Swp.)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A11, A12, A13	Disconnect stabilizing capacitor C4. Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
11.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A14	Reconnect C4. Adjust A13 so that 4.5MC marker occurs at center of crossover lines as in Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.

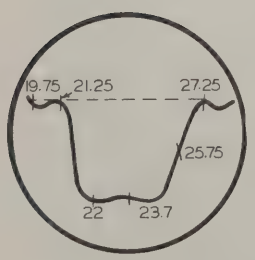


FIG. 1

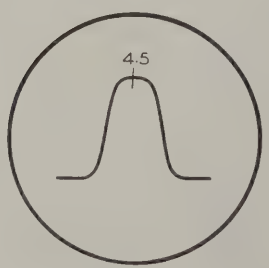


FIG. 2

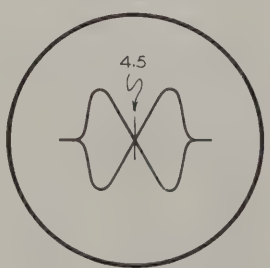


FIG. 3

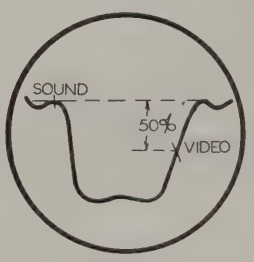


FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Leave the bias connected as under "Video IF Alignment".
The channel oscillator adjustment screws are reached through a hole above and slightly to the left of the channel selectors shaft. The correct adjustment screw is accessible thru this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205. 25MC 209. 75MC	12	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A15	Adjust to place sound marker in trap notch as in Fig. 4. Video marker should be at 50%.
			213MC (10MC Swp.)	211. 25MC 215. 75MC	13		A16	
			201MC (10MC Swp.)	199. 25MC 203. 75MC	11		A17	
			195MC (10MC Swp.)	193. 25MC 197. 75MC	10		A18	
			189MC (10MC Swp.)	187. 25MC 191. 75MC	9		A19	
			183MC (10MC Swp.)	181. 25MC 185. 75MC	8		A20	
			177MC (10MC Swp.)	175. 25MC 179. 75MC	7		A21	
			85MC (10MC Swp.)	83. 25MC 87. 75MC	6		A22	
			79MC (10MC Swp.)	77. 25MC 81. 75MC	5		A23	
			69MC (10MC Swp.)	67. 25MC 71. 75MC	4		A24	
			63MC (10MC Swp.)	61. 25MC 65. 75MC	3		A25	
			57MC (10MC Swp.)	55. 25MC 59. 75MC	2		A26	

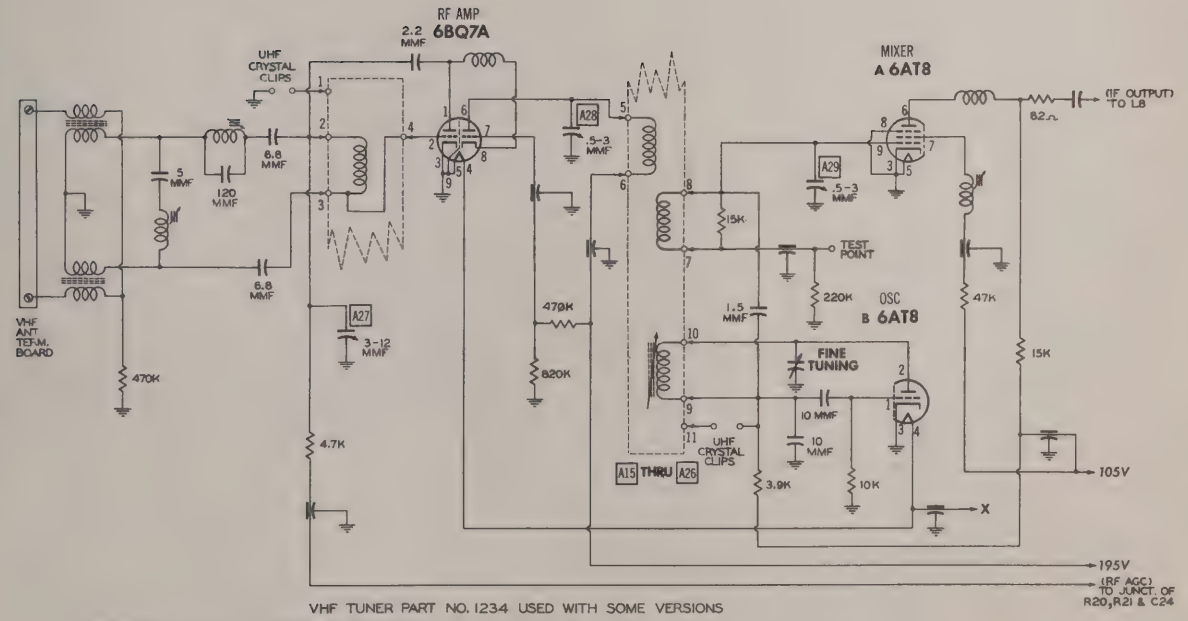
RF AND MIXER ALIGNMENT

Leave the bias connect as under "Video IF Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205. 25MC 209. 75MC	12	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A27, A28, A29	Adjust for maximum amplitude and MINIMUM tilt with sound marker in trap notch and video marker at 50%.

4.5MC TRAP ALIGNMENT

Tune in a TV station and turn the fine tuning control clockwise until 4. 5MC beat appears in the picture. Adjust A30 for MINIMUM 4. 5MC beat interference.



VHF TUNER PART NO. 1234 USED WITH SOME VERSIONS

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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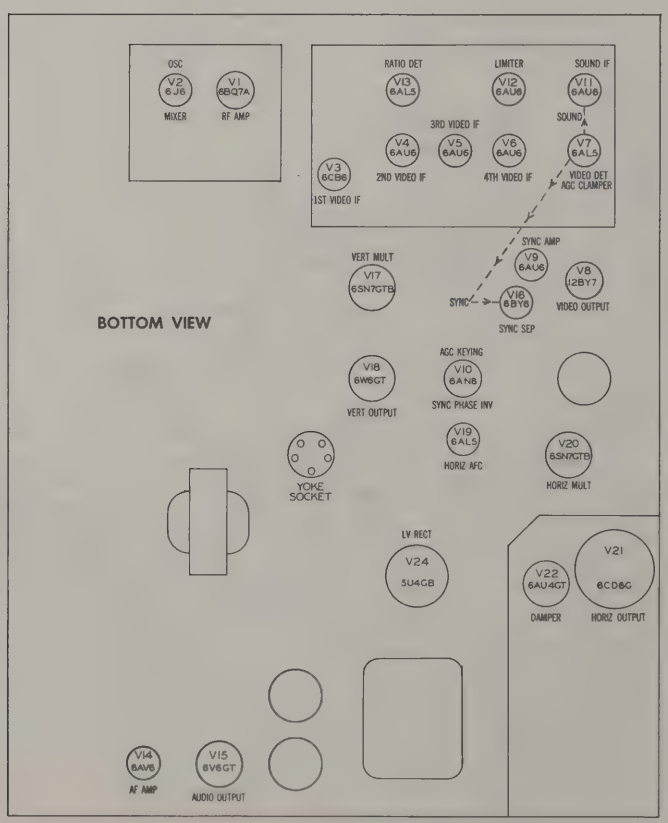
ALTERNATE TUNER SCHEMATIC

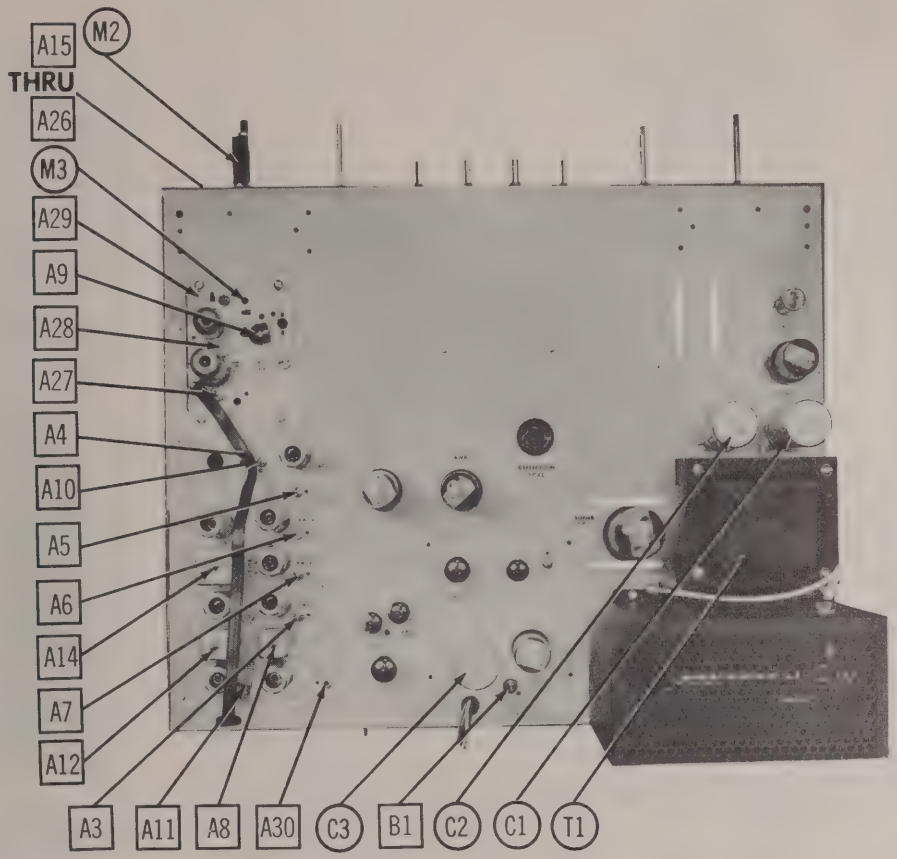
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	1Meg	0Ω	.1Ω	0Ω	† 2.3KΩ	130KΩ	INF	0Ω
V 2	6J6	† 20KΩ	† 15KΩ	.1Ω	0Ω	230KΩ	10KΩ	0Ω		
V 3	6CB6	100KΩ	47Ω	.1Ω	0Ω	† 3KΩ	† 3KΩ	0Ω		
V 4	6AU6	100KΩ	0Ω	.1Ω	0Ω	† 2.8KΩ	† 2.8KΩ	68Ω		
V 5	6AU6	100KΩ	0Ω	.1Ω	0Ω	† 2.6KΩ	† 2.6KΩ	68Ω		
V 6	6AU6	.9Ω	0Ω	.1Ω	0Ω	† 2.4KΩ	† 2.4KΩ	150Ω		
V 7	6AL5	1Ω	950KΩ	.1Ω	0Ω	0Ω	0Ω	4KΩ		
V 8	12BY7	80Ω	4KΩ	0Ω	0Ω	0Ω	.1Ω	† 5.5KΩ	† 11KΩ	0Ω
V 9	6AU6	12KΩ	0Ω	0Ω	.1Ω	† 9.5KΩ	† 2.3KΩ	0Ω		
V 10	6AN8	† 5.5KΩ	† 390KΩ	5.5KΩ	.1Ω	0Ω	900KΩ	† 800Ω	† 50KΩ	† 2.3KΩ
V 11	6AU6	1.8Ω	0Ω	.1Ω	0Ω	† 3.3KΩ	† 3.3KΩ	150Ω		
V 12	6AU6	47KΩ	0Ω	0Ω	.1Ω	† 12KΩ	† 12KΩ	0Ω		
V 13	6AL5	INF	INF	0Ω	.1Ω	0Ω	0Ω	20KΩ		
V 14	6AV6	10Meg	0Ω	.1Ω	0Ω	0Ω	0Ω	† 180KΩ		
V 15	6V6GT	TP	0Ω	† 2.4KΩ	† 1.8KΩ	470KΩ	NC	.1Ω	270Ω	
V 16	6BY6	60KΩ	0Ω	0Ω	.1Ω	† 390KΩ	† 11KΩ	2.7Meg		
V 17	6SN7GTB	60KΩ	† 240KΩ	1.5KΩ	300KΩ	◓ 2.5Meg	1.5KΩ	.1Ω	0Ω	
V 18	6W6GT	NC	.1Ω	† 900Ω	† 1.4KΩ	1.8Meg	NC	0Ω	1.1KΩ	
V 19	6AL5	INF	INF	.1Ω	0Ω	8Ω	0Ω	8Ω		
V 20	6SN7GTB	INF	† 11KΩ	1.5KΩ	120KΩ	† 230KΩ	1.5KΩ	.1Ω	0Ω	
V 21	6CD6G	NC	0Ω	300Ω	NC	470KΩ	NC	.1Ω	† 14KΩ	TOP CAP ◓ 80Ω
V 22	6AU4GT	NC	NC	370KΩ	NC	† 85Ω	NC	INF	INF	
V 23	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ◓ 455Ω
V 24	5U4GB	NC	10KΩ	NC	27Ω	NC	26Ω Ω	NC	10KΩ	
V 25	24CP4A	0Ω	† 180KΩ	PIN 10 ◓ 100KΩ	PIN 11 † 180KΩ	PIN 12 .1Ω				

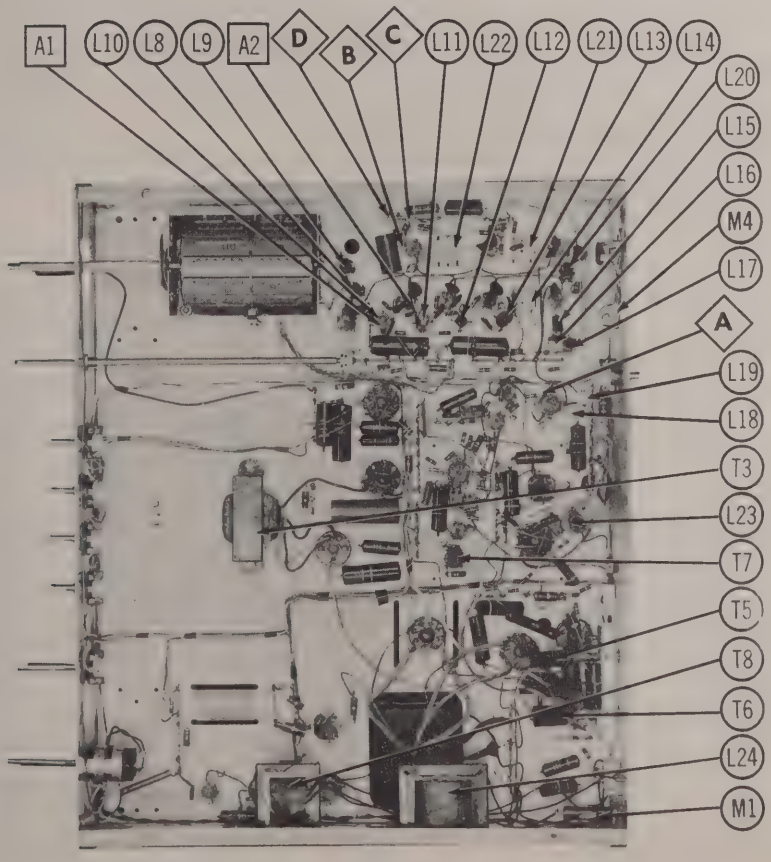
† MEASURED FROM PIN 8 OF V24.
◓ MEASURED FROM PIN 3 OF V22.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

SET 314 FOLDER 4

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	REPLACEMENT DATA: FLEETWOOD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amp.	6BQ7A	6BQ7A	
V2	Osc.-Mixer	6J8	6J8	
V3	1st Video IF Amp.	6CB6	6CB6	
V4	2nd Video IF Amp.	6AU6	6AU6	
V5	3rd Video IF Amp.	6AU6	6AU6	
V6	4th Video IF Amp.	6AU6	6AU6	
V7	Video Det. - AGC Clamper	6AL5	6AL5	
V8	Video Output	12BY7	12BY7	
V9	Sync Amp.	6AU6	6AU6	
V10	AGC Keying-Sync Phase Inv.	6AN8	6AN8	
V11	Sound IF Amp.	6AU6	6AU6	
V13	Limiter	6AU6	6AU6	
V19	Ratio Det.	6AL5	6AL5	
V14	AF Amp.	6AV6	6AV6	
V15	Audio Output	6V6GT	6V6GT	
V18	Sync Sep.	6BY8	6BY8	
V17	Vert. Mult.	6SN7GTB	6SN7GTB	
V18	Vert. Output	6W6GT	6W6GT	
V19	Horiz. AFC	6AL5	6AL5	
V20	Horiz. Mult.	6SN7GTB	6SN7GTB	
V21	Horiz. Output	6CD6G	6CD6G	
V23	Damper	6AU6GT	6AU6GT	
V23	HV Rect.	1B3GT	1B3GT	
V24	LV Rect.	5U4GB	5U4GB	

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA: FLEETWOOD PART No.	CRS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V25	24CP4A	24CP4 ①	24CP4A ①	24CP4 ①	
	24CP4A ①	24CP4 ①	24CP4	24CP4	
	21AMP4	21AMP4	21AMP4/21ACP4	21AMP4	
		21AMP4A ①	21AMP4A/21ACP4A ①	21AMP4A ① ③	
				21ACP4	
				21ACP4A ③	
	27EP4 ①	27EP4 ①	27EP4 ①	27EP4 ③	
	27EP4 ①	27EP4 ①	27EP4 ①	27EP4 ③	

ELECTROLYTIC CAPACITORS

ITEM No	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FLEETWOOD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲ 40	475		AFH2-71	BO53	FP362	TM-D40-500	D-265	TVL-2830
B	▲ 40	475		AFH4-87	DO52	FP376.5 TC26	TM-4019	Q-340	TVL-3780 TVA-1305
C2A	▲ 20	450							
B	▲ 20	450							
C	20	25							
D	▲ 20	450							
C3A	▲ 80	450		AFH4-14	DO13	FP376.5	TM-T20-450	T-140	TVL-4783
B	▲ 80	450							
C	80	450							
D	20	450	(Note 1)						
C4	B	50		BRE 50/B	BBR50	TC20	TD-5-50	MMT-0505	TVA-1303
C5	100	50		PRS 150/50	BR415	TC350	TD-100-50	MTH-B50	TVA-1310

Note 1. Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	3-8			829-10						
C7	800									
C8	9			NPO-D13	TCZ-3R3	Z207	NPOA-030	ZT-553	5TCCB-V33	
C9	.5-3				839-5		315-01-0R5	CT565A		
C10	800									
C11	47			BPD-000047	DD-470	GO33	831-470	UC-5447	5GA-Q47	
C12	4.5			NPO-SL 5	TCZ-1R5	Z064	NPOA-1R5	ZT-5515	5TCCB-V15	
C13	800									
C14	130			BPD-00013	DD-131	GO44	61-131	UC-5313	5GA-T13	
C15	.5-3				839-3		315-01-0R5	CT565A		
C16	10			NPO-D10	TCZ-10	Z018	NPOA-100	ZT-541		
C17	5									
C18	1000			BPD-001	DD-103	KO69	801-001	DC-521	5HK-D1	
C19	10			N750-D10	TCN-10	NO18	N750A-100	NT-561	5TCU-Q1	
C20	68			N750-D68	TCN-68	NO38	N750A-680		5TCU-Q68	
C21	470			BPD-00047	DD-471	KO80	831-471	UC-5347	5GA-T47	
C22	800									
C23	800									
C24	.47	200		P388M-47		CUB2P47		PT4047	5TM-P47	
C25	1.5			NPO-SL 5	TCZ-1R5	Z004	NPOA-1R5	ZT-5515	5TCCB-V15	
C26	33			NPO-S33	TCZ-32	Z034	NPOK-320		5TCC-Q32	
C27	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C28	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C29	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C30	82				TCZ-82	Z040	NPO-337-320			
C31	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C32	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C33	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C34	68			NPO-D68	TCZ-68	Z038	NPO-337-680		5TCC-Q68	
C35	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C36	.47	200		P388M-47		CUB2P47		PT4047	5TM-P47	
C37	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C38	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C39	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C40	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C41	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C43	100			NPO-D100	TCZ-100	TZ30	NPO-337-101	ZT-531	5TCC-T1	
C44	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C44	5.6									Note 2
C45	82				TCZ-82	Z040	NPO-337-820			
C46	56			NPO-D56	DS-560	Z036	GPLK-560	UC-5456		Note 2
C47	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C48	.022	600		P488N-22	DD-223	CUB4S22	817-02	PT4123	6TM-S22	
C49	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C50	.022	600		BPD-03	DD-223	CUB4S22	817-02	PT6123	6TM-S22	
C51	470	1500		BVD-15-470	DCM-471	MC747	15S6V-471	DC30347	5TCCB-T47	
C52	2.5			NPO-SL 5	TCZ-2R2	Z008	NPOA-2R2		5TCCB-V22	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FLEETWOOD PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C53	.5			NPO-S5	TCZ-4R5	Z011	NPOA-050	ZT-555	5TCCB-V47	Note 2
C54	47			NPO-D047	TCZ-47	SO33	NPO-338-470	ZT-5447	5TCC-Q47	
C55	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C56	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C57	5000			BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	Note 2
C58	100			NPO-S100	D4-101	TZ30	GPLK-101	UC-531	5CA-T1	
C59	5000			BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	
C60	5000			BPD-005	DD-503	KO80	811-005	DC-525	5HK-D5	
C61	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	Note 2
C62	680			S1-680	D4-681	TP30	GPSK-681	UC-5368	5GA-T68	
C63	.0047	600		BPD-0047	DS-472	CUB5D47	GP3-333-472	PT6247	6TM-D47	
C64	.033	600		BPD-03	DD-333	CUB5S22	817-02	PT6123	6TM-S23	
C65	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C66	022	600		BPD-02	DD-205	CUB5S22	817-02	PT6123	6TM-S22	
C67	.0047	600		BPD-0047	DS-472	CUB5D47	GP3-333-472	PT6247	6TM-D47	
C68	.0068	600		BPD-0068	DS-682	CUB5D68	GP3-333-682		6TM-D68	
C69	330	500		D1-00033	D5-331	5WET22	GP2K-231	MC340	1PM-S2	
C70A	10000					KO82	811-01	DC-511		
B	3000			4PA-101	KO72	801-002	DC-522	▲ V-2		
C	5000					KO80	811-005	DC-523		
D	5000					KO80	811-005	DC-525		
C71	.01	600		BPD-0068	D6-823	CUB6D68	GP3-333-683		6TM-D68	
C72	.0068	600				CUB6D47				
C73	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C74	.1	600		P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C75	500	500		BPD-0005	D6-501	5WET5	GP2K-501	MC345	1PM-S5	
C76	500	500		BPD-0005	D6-501	5WET5	GP2K-501	MC345	1PM-S5	
C77	5000			BPD-005	DD-502	KO80	811-005	DC-525	5HK-D5	
C78	.047	500		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C79	3900	500		1464-0039		1RS0349		MC9483	M3-239	
C80	390	500			D6-391	5RST39	811-391	MCE345	M3-239	
C81	.0047	600		BPD-047	D6-472	CUB6D47	GP3-333-472	PT6347	6TM-D47	
C82	270	500		NPO-S270	TCZ-270	5WET27	NPO-338-271	MCE341	M3-227	
C83	.1	600		P488N-1	DF-104	CUB6P1		PT601	6TM-P1	
C84	.47	200		P388N-47		CUB2P47		PT4047	5TM-P47	
C85	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C86	.047	600		BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C87	3000	3000		UV-300	TV3-303	MMU127S	413	HV30035A	3DE-T3	
C88	.33	400		P488N-32		CUB4P33		PT4032	4TM-P32	
C89	100	2500		HVD-30-100	DD30-101	V37I	5KV-101	DC3031	30GA-T1	Note 2
C90	.022	600		BPD-03	DD-223	CUB5S22	817-02	PT6123	6TM-S23	
C91	.022	600		BPD-03	DD-223	CUB6S33	817-02	PT6123	6TM-S22	

Note 2. Not used in some versions.
Note 3. Some versions use 1N34A* in this application.
e Items C70A, C70B, C70C, C70D, R80A, R80B, R90C and R90D are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FLEETWOOD PART No.	CENTRALAB PART No	CLAROSTAT PART No	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1000Ω	1	1083	F1-5		QJ-877 *	UF13R	Contrast (Panel)
B	500KΩ	½		R2-41			UR55A	Volume (Rear)
C	Switch			KB-1			UB-38	Attach to R1B.
R2A	500KΩ	½	1187	B-59	A47-500K-B	Q11-123	U-50	Brightness
B	Shaft		Not Req.	Not Req.	Not Req.	Not Req.	Not Req.	Attach to R2A.
R3A	100KΩ	½	1106	AB-40	A47-100K-S	Q11-128	U-41	Horizontal Hold
B	Shaft		Not Req.	AK-4	RS-2	Not Req.	Not Req.	Attach to R3A.
R4A	2MEG	½	1104	AB-78	A47-2MEG-S	Q11-139	U-56	Height
B	Shaft		Not Req.	AK-4	RS-2	Not Req.	Not Req.	Attach to R4A.
R5A	3000Ω	2	1105		A43-3000	WPK3000	R3000L	Vertical Linearity (Wire Wound)
B	Shaft		Not Req.		RS-3	Not Req.	D6-38	Attach to R5A.
R6A	250KΩ	½	1107	AB-50	A47-250K-S	Q11-130	U-46	Vertical Hold
B	Shaft		Not Req.	AK-4	RS-2	Not Req.	Not Req.	Attach to R6A.
R7A	100KΩ	½	884	AB-40	A47-100K-S	Q11-128	U-41	AGC
B	Shaft		Not Req.	AK-1	FK3-1A	Not Req.	Not Req.	Attach to R7A.

* Concentrikit Equivalent; K-2 Kit, Base Elements & Shafts; B1T-108, B2D-203 (Panel)
B13-133, R1-216 (Rear)
T6-1 (Switch)

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FLEETWOOD PART No.	IRC PART No.	NOTES
R8	18KΩ	1		BTS-18K	
R9	47KΩ	1		BTS-47K	
R10	330KΩ	1		BTS-330K	
R11	220KΩ	1		BTS-220K	
R12	180KΩ	1		BTS-180K	
R13	10KΩ	1		BTS-10K	
R14	220KΩ	1		BTS-220K	
R15	10KΩ	1		BTS-10K	
R16	15KΩ	1		BTS-15K	
R17	22KΩ	1		BTS-22K	
R18	5600Ω	1		BTA-5600	Note 1
R19	10KΩ	1		BTS-10K	
R20	2.2MEG	1		BTS-2.2MEG	
R21	470KΩ	1		BTS-470K	
R22	330Ω	1		BTS-330	
R23	1000Ω	1		BTS-1000	
R24	150Ω	1		BTS-150	
R25	470 5%	1		BTS-47 5%	
R26	6200Ω	1			
R27	1000Ω	1		BTS-1000	
R28	150Ω	1		BTS-150	
R29	68Ω	1		BTS-68	
R30	5200Ω	1			
R31	1000Ω	1		BTS-1000	
R32	150Ω	1		BTS-150	
R33	68Ω	1		BTS-68	
R34	5900Ω	1			
R35	5600Ω	1		BTA-5600	
R36	150Ω	1		BTS-150	
R37	150Ω	1		BTS-150	
R38	4700Ω	1		BTS-4700	
R39	22KΩ	1		BTS-22K	
R40	22KΩ	1		BTS-22K	
R41	4700Ω	5% 2		BTS-4700 5%	
R42	10KΩ	1		BTA-10K	
R43	330KΩ	1		BTS-330K	
R44	470KΩ	1		BTS-470K	
R45	330KΩ	1		BTS-330K	
R46	15000 5%	1		BTS-15000 5%	
R47	5600Ω	1		BTS-5600	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FLEETWOOD PART No.	IRC PART No.	NOTES
R48	47KΩ	1		BTS-47K	
R49	1.5MEG	1		BTS-1.5MEG	
R50	1000Ω	1		BTS-1000	Note 1
R51	15KΩ	1		BTS-15K	
R53	1.5MEG	1		BTS-1.5MEG	Note 2
R53	1000Ω	1		BTS-1000	
R54	150Ω	1		BTS-150	
R55	47KΩ	1		BTS-47K	
R56	15KΩ	1		BTA-15K	
R57	33KΩ	1		BTS-33K	
R58	47Ω	1		BTS-47	
R59	10KΩ	1		BTS-10K	
R60	10KΩ	1		BTS-10K	
R61	15KΩ	1		BTS-15K	
R62	10MEG	1		BTS-10MEG	
R63	1.5MEG	1		BTS-1.5MEG	
R64	220KΩ	1		BTS-220K	
R65	470KΩ	1		BTS-470K	
R66	1000Ω	2		BTD-1000	
R67	270Ω	1		BTS-270	
R68	22KΩ	1		BTS-22K	
R69	2.2MEG	1		BTS-2.2MEG	
R70	470KΩ	1		BTS-470K	
R71	1MEG	1		BTS-1MEG	
R72	47KΩ	1		BTS-47K	
R73	330K	1		BTS-330K	
R74	15KΩ	1		BTA-15K	
R75	6800Ω	1		BTS-6800	
R76	330KΩ	1		BTS-330K	
R77	4700Ω	1		BTS-4700	
R78	3900Ω	5% 1		BTS-3900 5%	
R79	1500Ω	5% 1		BTS-1500 5%	
R80A	22KΩ	1		BTS-22K	
B	22KΩ	1	e	BTS-22K	
C	8200Ω	1		BTS-8200	
D	8200Ω	1		BTS-8200	
R81	240KΩ	5% 1		BTA-240K 5%	
R82	220KΩ	1		BTS-220K	
R83	1.5MEG	1		BTS-1.5MEG	
R84	1500Ω	5% 1		BTS-1500 5%	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FLEETWOOD PART No.	IRC PART No.	NOTES
R85	15KΩ	1		BTS-15K	
R86	1.5MEG	1		BTS-1.5MEG	
R87	470Ω	2		BTS-470	
R88	470Ω	2		BTA-470	
R89	470Ω	1		BTA-470	
R90	560Ω	3			
R91	560Ω	3			
R92	100KΩ	3			
R93	100KΩ	3			
R94	470KΩ	3			
R95	1200Ω	3			
R96	4.7Ω	3		BW½-4.7	
R97	56000 5%	1			
R98	180Ω	3			
R99	270KΩ	1			Note 1
R100	5600Ω	1		BTA-5600	
R101	370KΩ	3			
R102	1MEG	3			
R103	1500Ω 5%	3			

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: FLEETWOOD PART No.	IRC PART No.	NOTES
R104	8200Ω	1			
R105	1500	1			
R106	470KΩ	1			
R107	680Ω	2			
R108	6800Ω	3			
R109	330Ω	10		1 3/4A-330	
R110	100KΩ	1		BTS-100K	
R111	330KΩ	1		BTS-330K	
R113	470Ω	1			Note 1
R113	82Ω	7		BW½-.82	
R114	100KΩ	1			
R115	100KΩ	1			
R116	10Ω	1		BTA-10	
R117	7500Ω	10		PW10-750	
R118	1500Ω	10		PW10-1500	
R119	33KΩ	1		BTA-33K	
R120	3.9Ω	3		BW3-3.9	
R121	100KΩ	3		BTE-100K	

Note 1. Not used in some versions.
Note 2. Some versions use a 1Meg ½W resistor in this application.
e Items R80A, R80B, R80C, R80D, C70A, C70B, C70D, are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
T1	117VAC	640 VCT	5VAC	6.3VAC	830		P2833 ①	P8336 ②	26R35 ③	
	② 2.16A	② .290A	② 3A	② 11A SEC. 4						
				6.3VAC ② 1.6A						

① Parallel and phase 6.3V ② 6.4A. Tape 6.3V ② .8A winding.
② Drill new mounting holes.
③ Tape 5V ② 3A winding. Parallel and phase three 6.3V windings.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	RCA PART No. TYPE No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz. Output Trans.	1062	FB410 *	HVO-36 *	235T1 *	X094 *	A-8253 *	FLY-16 *	D-50 *
T3	Vert. Output Trans.		Z1900 ②	A-2823		V307	A-8143	28S72	A-108X
T4A	Yoke (90°) Horiz. (12MH		DF606 ③	MDF-91 ③	237D1 ③	T90F13A/2 B	DY-13A ③	Y-14 ③	Y-40-1 ③
B	Vert. (40MH)					B			
T5	Horiz. Lin. Coil (0.4-11MH)	1134	RF800 ③	MWC-8 ③	213R1	201R15	WC-8	WC-22	WC-12 ③
T6	Width Coil (4.5-27.5MH)	1058	RF800 ③	MWC-11	218R1	201R10 ③	WC-10 ③	WC-18	WC-12 ③
T7	Horiz. AFC Pulse Trans. (Pri 14-. 7MH) (Sec .79-2. 82MH)	849							

① Drill new mounting hole(s).
② Use 8 to 1 turns ratio.
③ Connect horizontal damping network across yoke terminals #3 and #7. Use original network if necessary.
④ Use original horizontal damping network if necessary.
⑤ Enlarge mounting hole.
⑥ Use terminals 3 and 4.
⑦ Use red and blue terminals.
⑧ Use terminals 1 and 2.
⑨ Use plain terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Rem Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	9	9	9	9	9	8	9	9
	7	7	7	7	7	1	7	7
	5	5	5	5	5	2	5	5
	3	3	3	3	3	3	3	3
Connect Width Coil Across	1	1	1	1	1	4	1	1
	3 & 1	3 & 1	3 & 1	3 & 1	3 & 1	6 & 7	3 & 1	3 & 1
Special Notes						⑩		

⑩ Ground terminal #6.

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE: PRI	IMPEDANCE: SEC	REPLACEMENT DATA: FLEETWOOD PART No.	Halldorson PART No	Merit PART No	Stancor PART No	Thordarson PART No	Triad PART No	NOTES
T8	7.7KΩ	3.4Ω	857	Z1003	A3020	A3849	24S68	S-62	

COILS (RF-IF)

ITEM No	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coils	00CT	0Ω					
L2	Fil. Choke	0Ω						
L3	Neut. Coil	0Ω						
L4	RF, Mixer Grid, Osc. Coils	0Ω						
L5	Fil. Choke	0Ω						
L6	RF Coil	0Ω						
L7	Conv Plate	.8Ω				17-1063	TV-112	6349 *
L8	1st Video IF	.2Ω						
L9	19.75MC Trap	.2Ω	.9Ω	1203				
L10	2nd Video IF	.9Ω	.9Ω					6264
L11	3rd Video IF	1.7Ω	.9Ω	1183				6353
L12	4th Video IF	.9Ω	.9Ω	1184		17-1064	TV-116	6349

Includes 27.25MC Trap
Includes 21.25MC Trap

FLEETWOOD MODEL 810

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L13	Cathode Trap	0Ω	0Ω				6247	
L14	5th Video IF	1Ω	1Ω	1160				
L15	Series Peaking Coil	10.5Ω			19-3160 ▲		6120 ▲	150 Microhenries, Wound on 10KΩ resistor
L16	Shunt Peaking Coil	18Ω			19-3300		6132	315 Microhenries
L17	4.5MC Trap	1.3Ω		1042	20-1004	TV-151	1469	
L18	Series Peaking Coil	12.5Ω		1217	19-4201 ♦	TV-185 ♦	6154 ♦	226 Microhenries, Wound on 18KΩ resistor
L19	Shunt Peaking Coil	17.5Ω		1216	19-4400		6136	430 Microhenries
L20	1st Sound IF	1.8Ω		1079	20-1004	TV-151	1469	
L21	2nd Sound IF	2.2Ω		1078	16-3445 *	TV-113 ■	6203 ■	
L22	Ratio Det.	3.8Ω	.5ΩCT	956	17-1033	TV-110	1498	Tertiary Winding=.3Ω

* Use one winding only.
■ Use adaptor plate and use one winding only.
▲ Parallel with 10KΩ resistor.
♦ Parallel with 18KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA							NOTES
	PRI.	SEC.	FLEETWOOD PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	
L23	103Ω		994	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

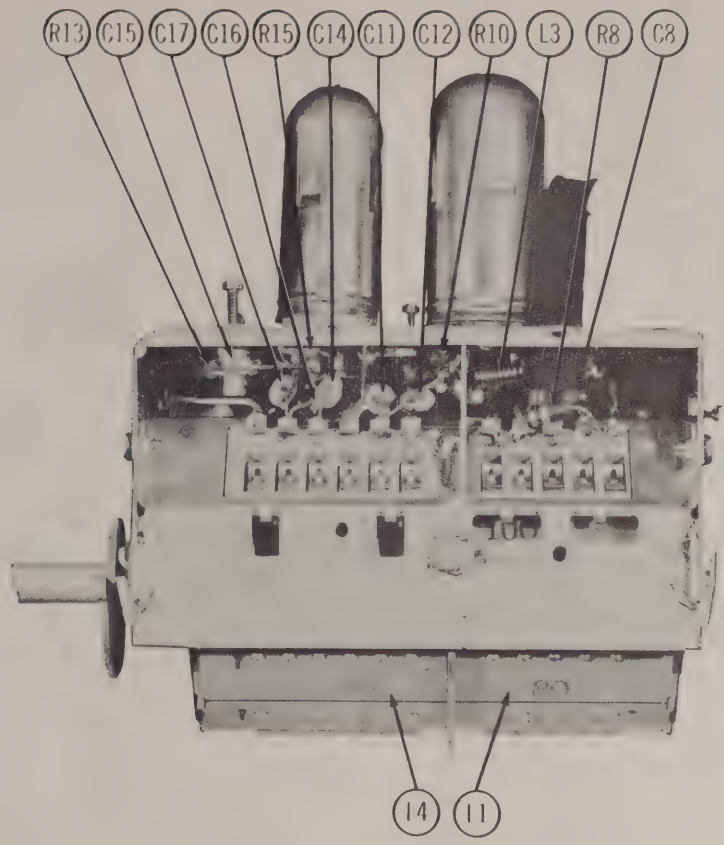
ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	FLEETWOOD PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L24	.290A	74Ω	3HY	1056	C5037	C2996			C-17X

FUSES

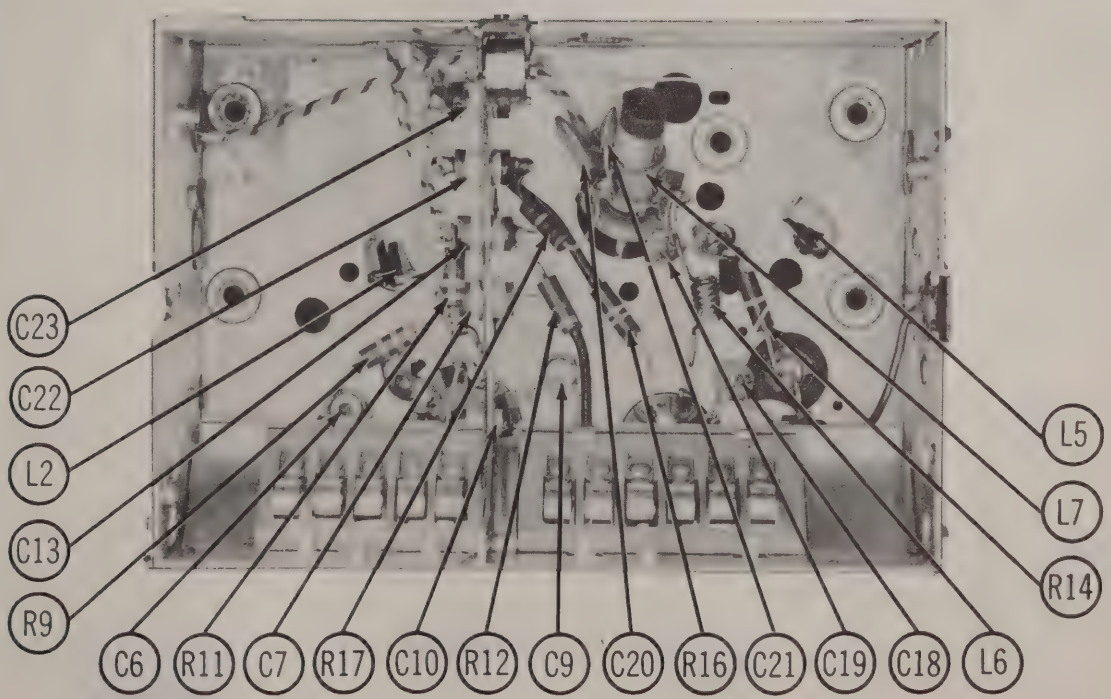
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			FLEETWOOD PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	5A 250V			312005. (3AG5A)	342001	MTH5	HKP

MISCELLANEOUS

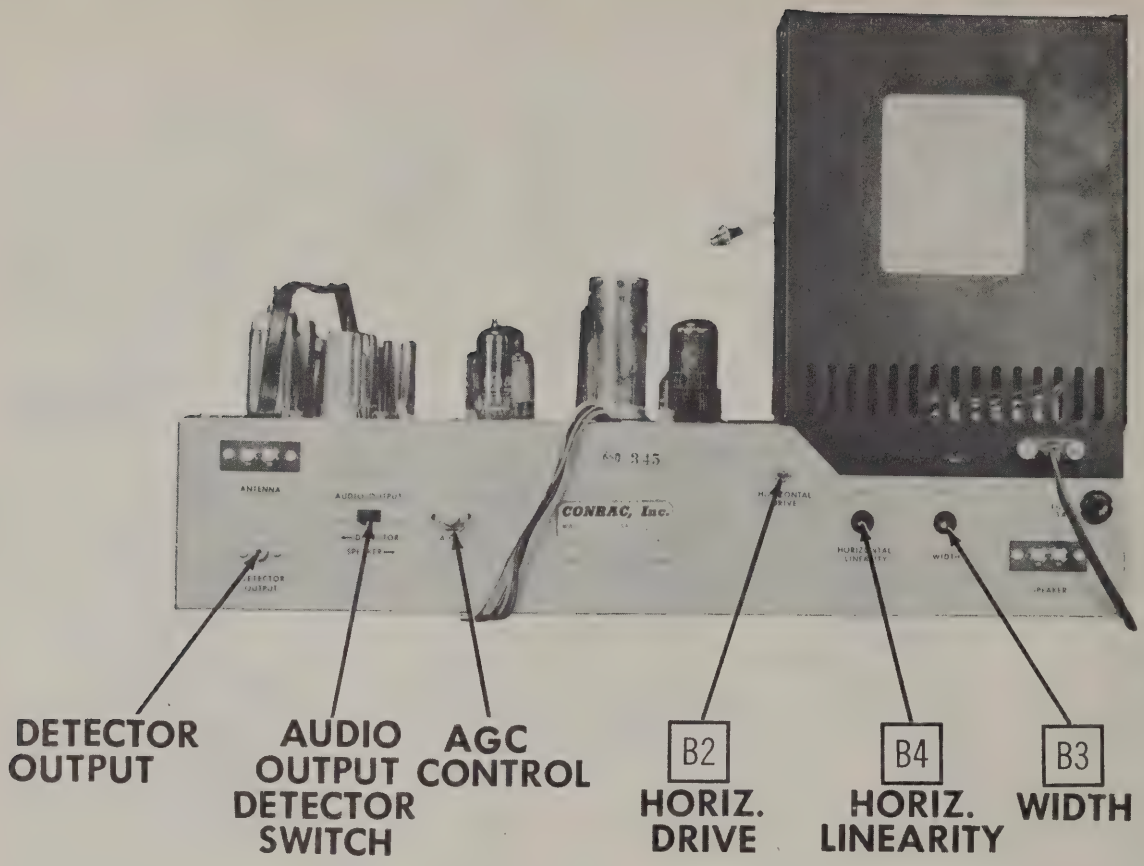
ITEM No.	PART NAME	FLEETWOOD PART No.	NOTES
M2	Dial Light		#44
M3A	Tuner		VHF Tuner
B	Tuner	1234	Alternate VHF Tuner. Used in some versions.
M4	Switch		Detector-Speaker (DPDT-Slide Type)
M5	Focus Magnet	S2603	Includes Centering Device
	Trimmer Cap.	5M11	Definition (L 5-5. 1MMF) Variable (Air)
B2	Trimmer Cap.	1186	Horiz. Drive (65-320MMF)



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

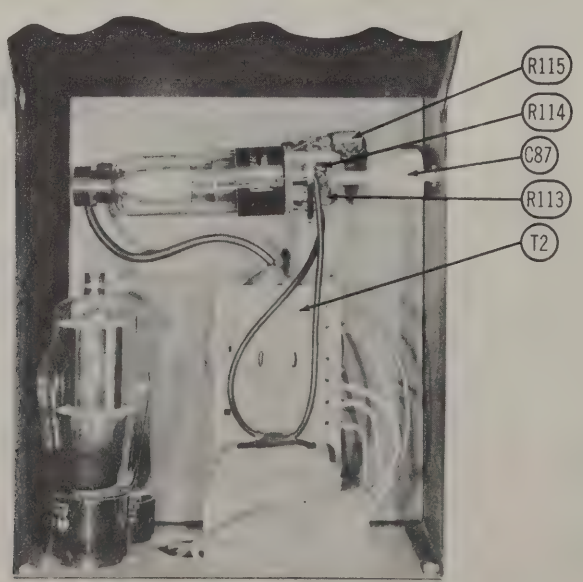
Turn the set on and tune in a TV station, preferably with a test pattern. Set the horizontal hold control to its mid- range position. Ground pin 1 (grid) of the horizontal multivibrator V20 to chassis. Adjust the horizontal oscillator slug (B1) until the picture is almost in sync. Remove short from pin 1 of V20 . Check pull-in action by switching off channel and back again.

If necessary retouch B1 for proper pull-in action.

Turn the horizontal drive trimmer (B2) clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture or without having the picture fall out of sync horizontally.

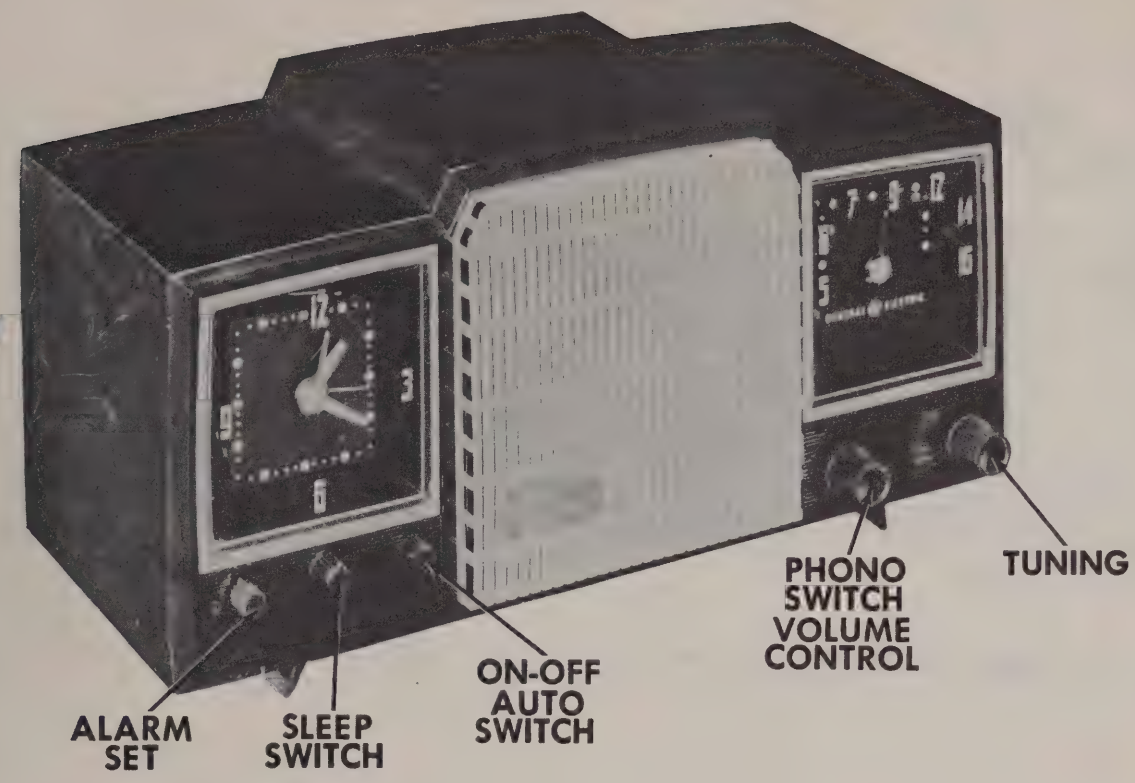
Adjust the width slug (B3) for a picture that is slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.



HIGH VOLTAGE COMPARTMENT

GENERAL ELECTRIC
MODELS 920, 921



GENERAL ELECTRIC
MODELS 920, 921

TRADE NAME	General Electric Models 920, 921
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver with Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	Adjust for maximum output while rocking tuning gang.

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L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		General Electric PART No.	STANDARD REPLACEMENT	
V1	Converter	12BE6	12BE6	
V2	IF Amplifier	12BA6	12BA6	
V3	Det. -AVC-AF Amp.	12AV6	12AV6	
V4	Output	50C5	50C5	
V5	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	General Electric PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	100	150	RCE-166	PRS150V804020	BBRT84215	TCT3117	TDL-804020-150	FMT-1540	TVA-3455
B	50	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Electric PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	.05	400	UCC-045	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	47		RCW-3075	SI47	DD-470	GO33	831-470	UC-5447	5GA-Q47	
C4	220		RCW-3195	SI220	DD-221	GO51	811-221	UC-5322	5GA-T22	
C5	.02	400	RCC-129	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C6	220		RCW-3195	SI220	DD-221	GO51	811-221	UC-5322	5GA-T22	
C7	.02	400	RCC-129	BPD-02	DD-203	CUB4S2	817-02	PT412	4TM-S2	
C8A	500		RCW-3104	SI500	D6-501	KO61	811-501	UC-535	5GA-T5	
B	6800			SI6800	D6-682	KO81	811-0068		5HK-D68	
C9	.047	200	RCC-126	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C10	.047	600	RCN-053	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C11	.05	400	UCC-045	BPD-05	DF-503	CUB4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Electric PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	4Meg	½	RRC-330					Volume & Switch.Tap at 2Meg

RESISTORS

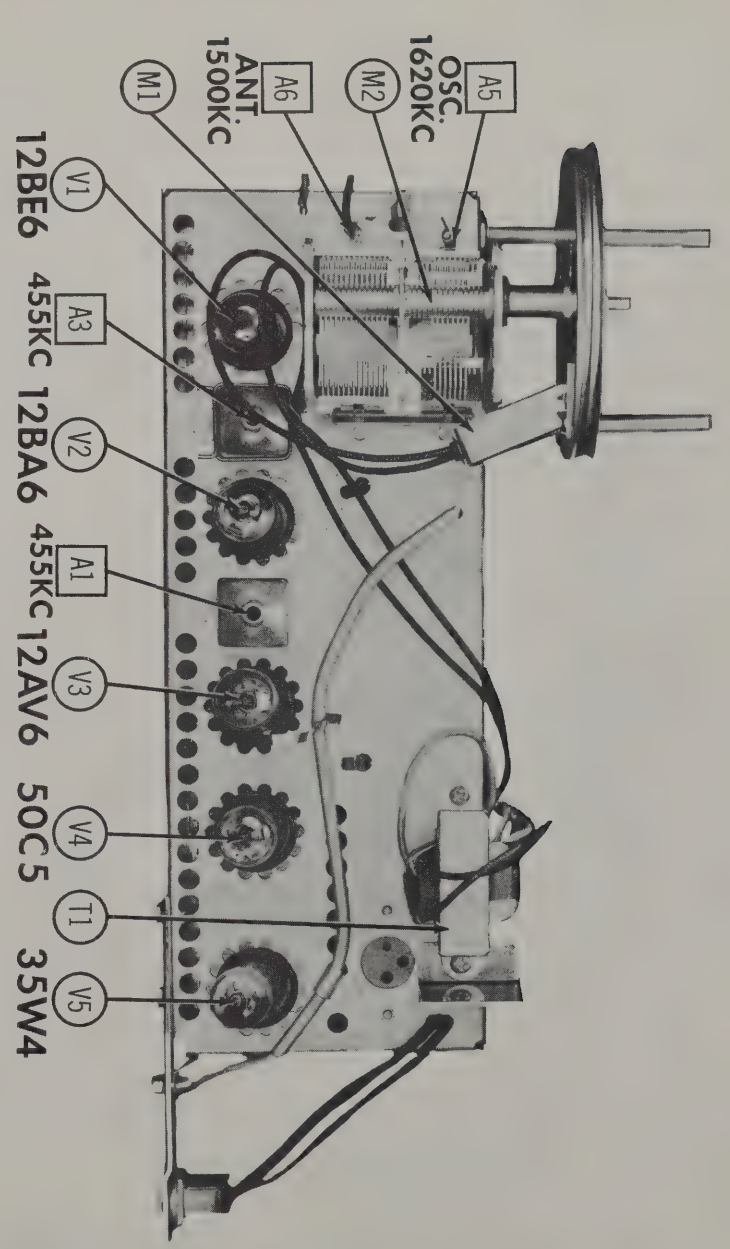
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	100Ω	½		BTS-100	
R4	2.2Meg	½		BTS-2.2Meg	
R5	68Ω	½		BTS-68	
R6	330KΩ	½		BTS-330K	
R7	6.8Meg	½		BTS-6.8Meg	
R8	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R9	470KΩ	½		BTS-470K	
R10	4700Ω	½		BTS-4700	
R11	1500Ω	2		BTB-1500	
R12	150Ω	½		BTS-150	
R13	820Ω	½		BTS-820	
R14	15KΩ	½		BTS-15K	
R15	18Ω	½		BTS-18	

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3.4Ω SEC 2 63.4Ω RES.	RTO-157						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5 1/4"	PM	3.4Ω	ROP-030	52A1	228S1	

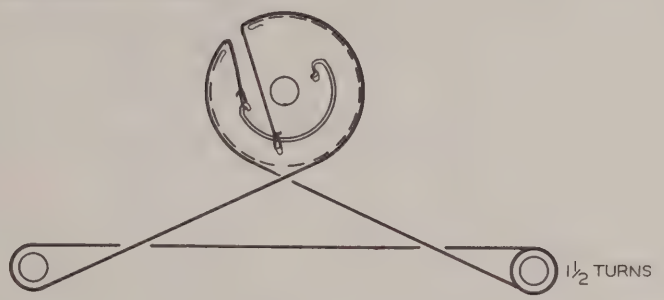
COILS (RF-IF)

ITEM No.	USE	DC RES:		REPLACEMENT DATA				NOTES
		PRI.	SEC.	General Electric PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.2Ω		RAB-270				Includes Cabinet Back
L2	Osc. Coil	.6Ω	6.5Ω	RLC-122	14-1074	BC-394	70-Osc.	
L3	Input IF	14Ω	14Ω	RTL-143	16-6780	BC-352	12-C1	
L4	Output IF	14Ω	14Ω	RTL-143	16-6780	BC-353	12-C2	

MISCELLANEOUS

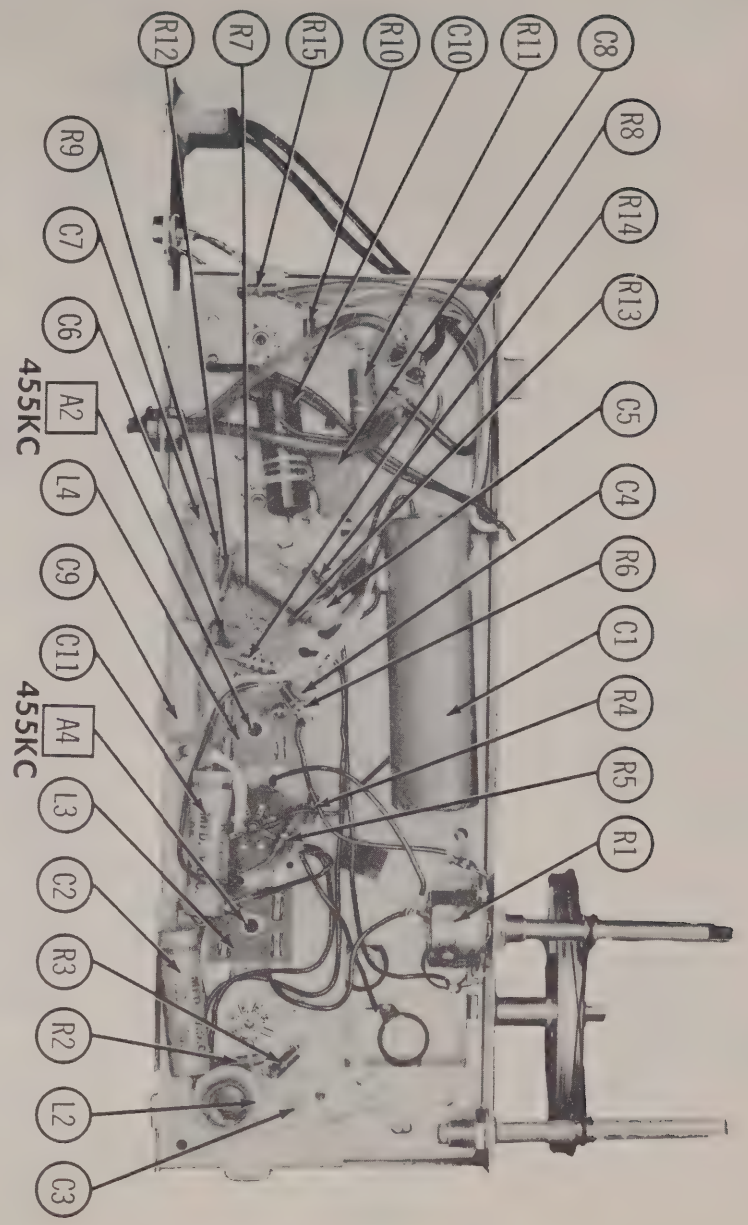
ITEM No.	PART NAME	General Electric PART No.	NOTES
M1	Dial Light		#44
M2	Tuning Cap.	RCT-090	2 Gang (28-465MMF, 24-150MMF)
M3	Clock Assy.	RZC-053	Model 920
	Clock Assy.	RZC-054	Model 921
	Cabinet	RAU-451	Model 920
	Cabinet	RAU-452	Model 921
	Knob	RDK-515	Tuning & Volume
	Knob	RZK-037	Clock
	Dial Scale	RDS-136	Model 920
	Dial Scale	RDS-137	Model 921
	Dial Pointer	RDP-084	
	Crystal	RDW-095	For Dial Scale-Model 920
	Crystal	RDW-096	For Dial Scale-Model 921
	Crystal	RZW-022	For Clock-Model 920
	Crystal	RZW-023	For Clock-Model 921

TUNING GANG FULLY CLOSED

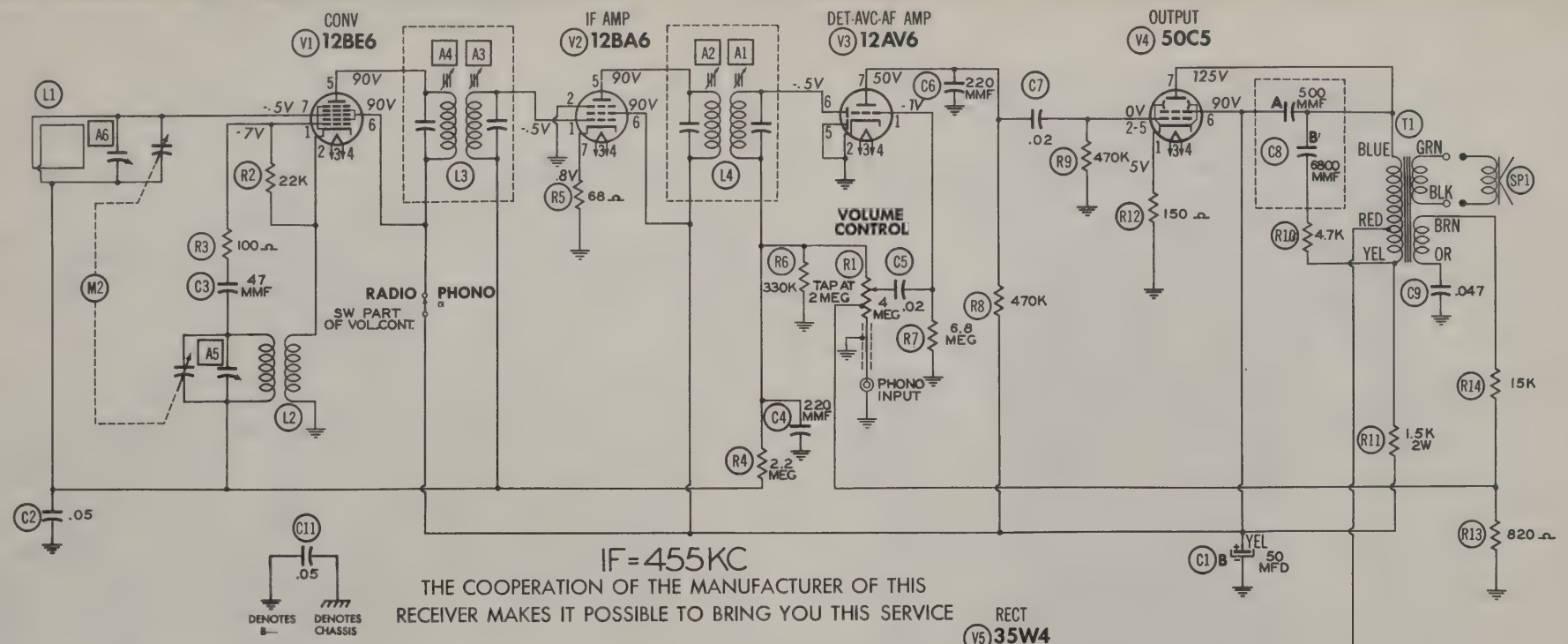


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



GENERAL ELECTRIC MODEL 920



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	12Ω	24Ω	† 1.5KΩ	† 1.5KΩ	2.5Meg
V 2	12BA6	2.5Meg	0Ω	24Ω	36Ω	† 1.5KΩ	† 1.5KΩ	68Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	330KΩ	† 471KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	† 1.5KΩ	† 278Ω
V 5	35W4	TP	TP	86Ω	121Ω	116Ω	116Ω	30KΩ

ALL MEASUREMENTS TAKEN WITH CLOCK DISCONNECTED. SELECTOR SWITCH IN RADIO POSITION.
† MEASURED FROM PIN 7 OF V5.
TP-TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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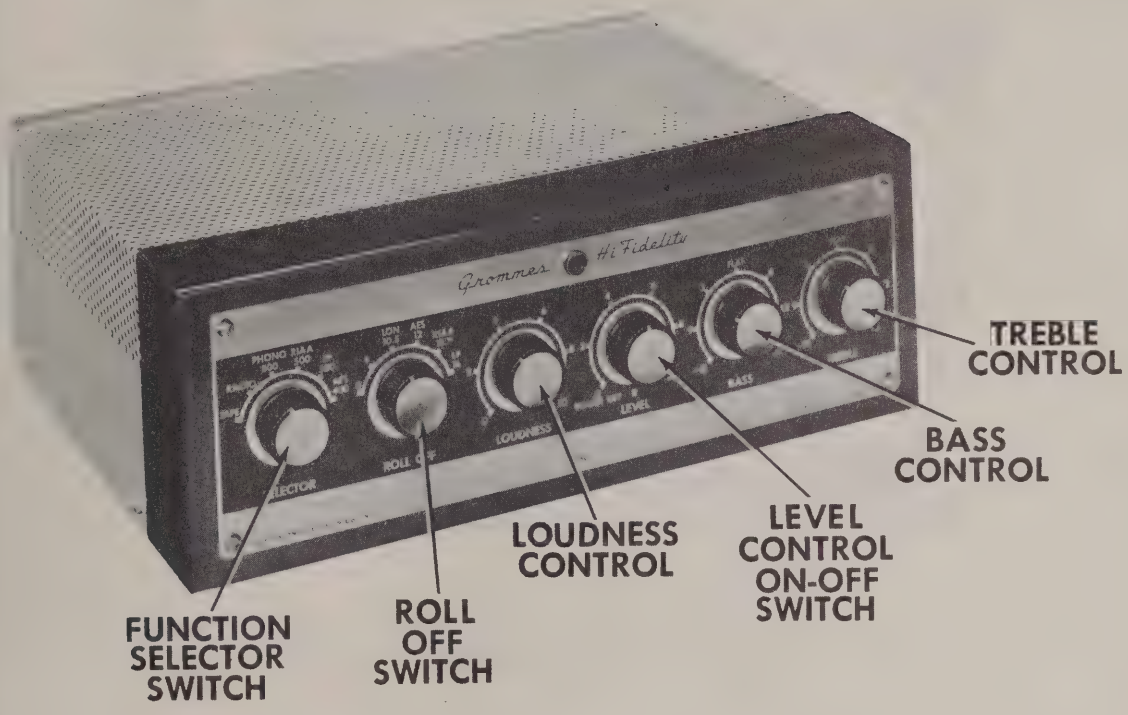
GROMMES
MODEL 55C



GROMMES
MODEL 55C

TRADE NAME	Grommes Model 55C
MANUFACTURER	Precision Electronics, 9101 King Ave., Franklin Park, Ill.
TYPE SET	AC Operated 4 Channel Amplifier
TUBES (Six)	Types 12AX7 Phono Pre-Amp., 12AX7 1st AF Amp. -2nd AF Amp., 12AX7 3rd AF Amp. -Phase Inv., (2) 6V6GT Output, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .62 Amp. @ 117 Volts AC

PROPERTY OF
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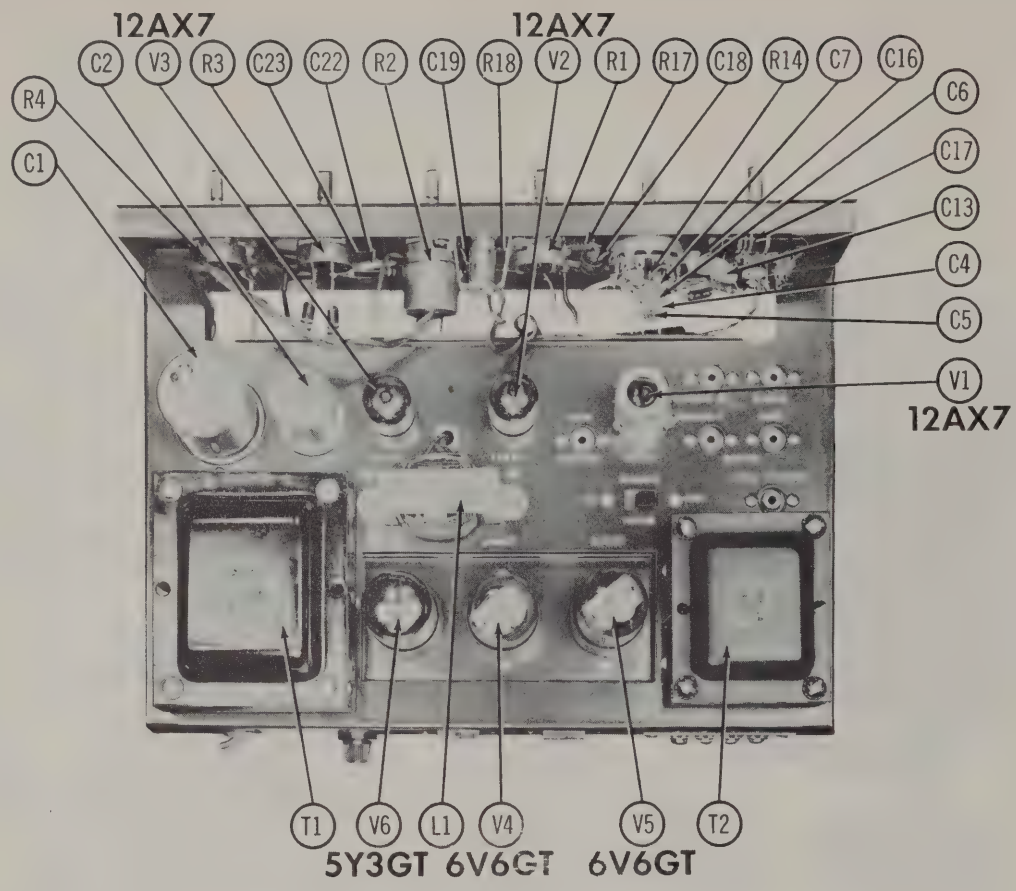
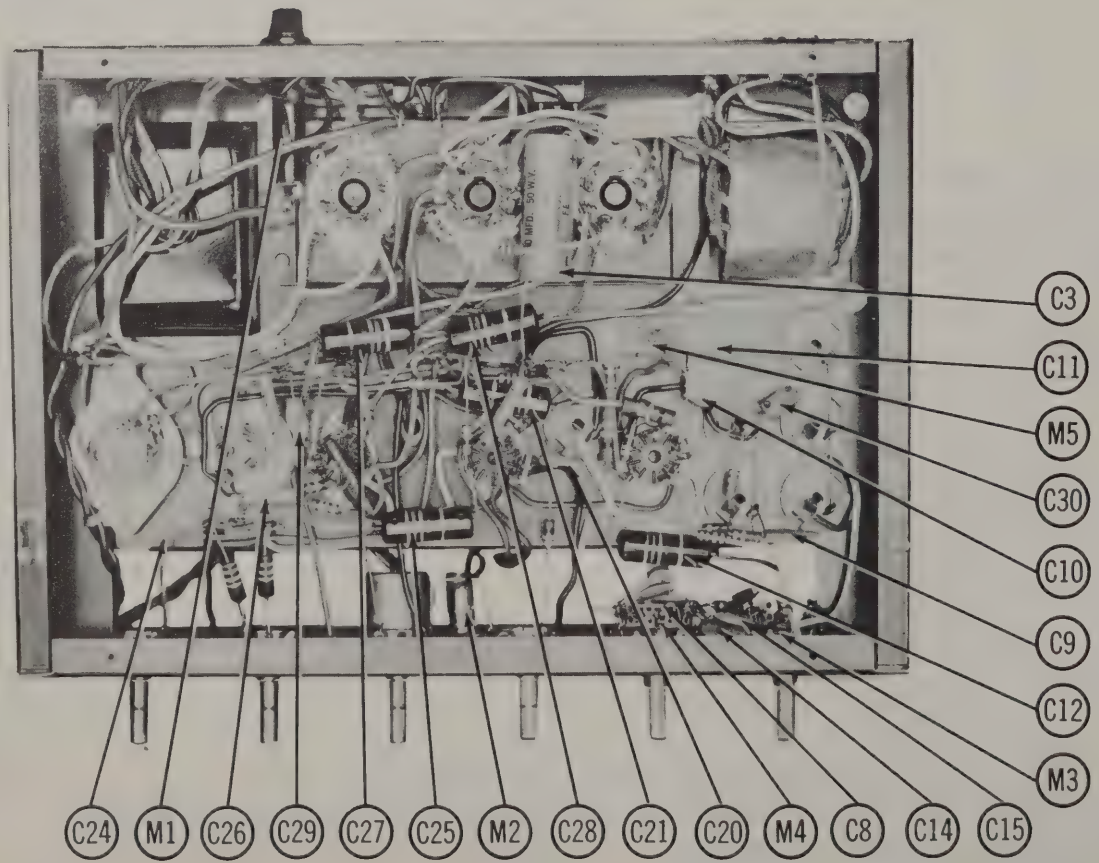
CHASSIS TOP VIEW



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		GROMMES PART No.	STANDARD REPLACEMENT	
V1	Phono Pre-Amp.	12AX7	12AX7	
V2	1st AF Amplifier- 2nd AF Amplifier	12AX7	12AX7	
V3	3rd AF Amplifier- Phase Inverter	12AX7	12AX7	
V4	Output	6V6GT	6V6GT	
V5	Output	6V6GT	6V6GT	
V6	Rectifier	5Y3GT	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	GROMMES PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	▲ 40	400			DI24	FP307.5	TM-3094	Q-035	
B	■ 30	350			BR4045	TC62		MT-4530	
C	▲ 10	300							
D	20	25	Note 1						
C2A	▲ 10	250			BO20	FP231	TM-D10-250	D-105	TVL-2510
B	■ 10	250			BRH151	TC2501	TD-100-15	MTH-1510	TVA-1160
C	100	15							
C3	50	50		PRS50V50	BR505	TC39	TD-50-50	FM-0550	TVA-1308

Note 1. C1D is not used.

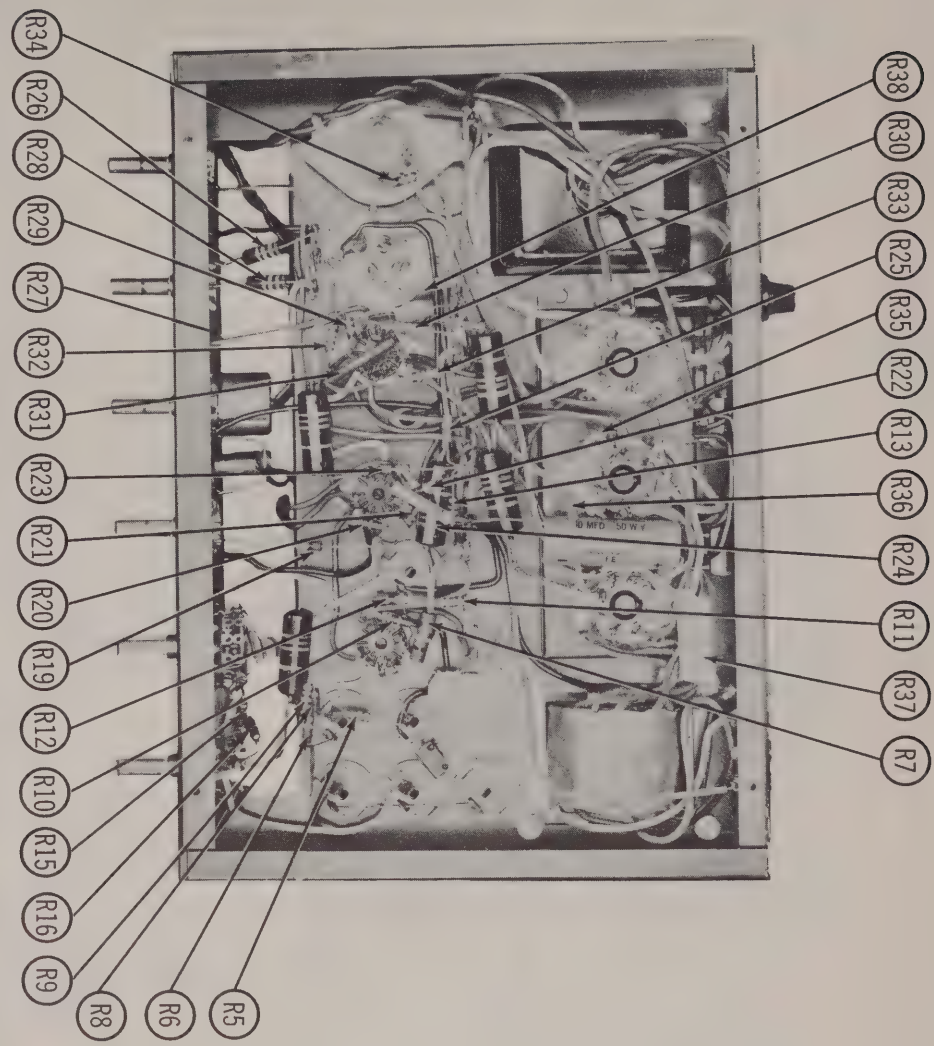
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	GROMMES PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	330			BPD-00033	DD-331	GO56	811-331		5GA-T33	
C5	750			SI750	DD-751	GO66	811-751	UC-5375	5GA-T75	
C6	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C7	1500						811-152			
C8	2000									
C9	3000			BPD-003	DD-302	KO76	811-003	UC-523	5HK-D3	
C10	10000			BPD-01	DD-103	KO82	811-01	DC511	5HK-S1	
C11	10000			BPD-01	DD-103	KO82	811-01	DC511	5HK-S1	
C12	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C13	2000									
C14	2000									
C15	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C16	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C17	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C18	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C19	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C20	10000			DD-103	DD-103	KO82	811-01	DC511	5HK-S1	
C21	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C22	5000			BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C23	5000			BPD-005	DD-502	KO80	811-005	DC525	5HK-D5	
C24	470			BPD-00047	D6-471	KO60	811-471	UC-5347	5GA-T47	
C25	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C26	250	500		1469-00025		5R5T25		MCB240	MS-325	
C27	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C28	.047	400		BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C29	1000			1464-001		1R5D1	811-102	MCB255	MS-21	
C30	100	500		SI100	D6-101	5W5T1	GP1K-101	MC235	1FM-31	Note 2

Note 2. Not used in some versions.

CHASSIS BOTTOM VIEW - RESISTOR VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	GROMMES PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	500KΩ	½		ABT-159				Loudness Tap at 50K & 100KΩ
B	Shaft			AK-9				Attach to R1A.
R2A	500KΩ	½		ABT-66	A47F3-500K		UT-427	Level Tap at 80KΩ
B	Shaft			AK-9	RS-2		Not Req.	Attach to R2A.
C	Switch			KB-1	SWE-12		US-26	Attach to R2A.
R3A	1Meg	½		AB-69	A47-1Meg-S	Q11-137	U-54	Bass
B	Shaft			AK-9	RS-2	Not Req.	Not Req.	Attach to R3A.
R4A	1Meg	½		AB-69	A47-1Meg-S	Q11-137	U-54	Treble
B	Shaft			AK-9	RS-2	Not Req.	Not Req.	Attach to R4A.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R5	22KΩ	½		BTS-22K	
R6	22KΩ	½		BTS-22K	
R7	100KΩ	1		BTA-100K	
R8	2200Ω	½		BTS-2200	
R9	4700Ω	½		BTS-4700	
R10	3.3Meg	½		BTS-3.3Meg	
R11	4.7Meg	½		BTS-4.7Meg	
R12	100KΩ	1		BTA-100K	
R13	47KΩ	½		BTS-47K	
R14	100KΩ	½		BTS-100K	
R15	1Meg	½		BTS-1Meg	
R16	2.2Meg	½		BTS-2.2Meg	
R17	22KΩ	½		BTS-22K	
R18	22KΩ	½		BTS-22K	
R19	100KΩ	½		BTS-100K	
R20	3.3Meg	½		BTS-3.3Meg	
R21	470KΩ	½		BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	GROMMES PART No.	IRC PART No.	
R22	100KΩ	½		BTS-100K	
R23	100KΩ	½		BTS-100K	
R24	1000Ω	½		BTS-1000	
R25	22KΩ	½		BTS-22K	
R26	68KΩ	1		BTA-68K	
R27	68KΩ	½		BTS-68K	
R28	68KΩ	1		BTA-68K	
R29	10KΩ	½		BTS-10K	
R30	220KΩ	½		BTS-220K	
R31	100Ω 5%	½		BTS-100 5%	
R32	47KΩ	½		BTS-47K	
R33	220KΩ	½		BTS-220K	
R34	10KΩ	½		BTS-10K	
R35	220KΩ	½		BTS-220K	
R36	270KΩ	½		BTS-270K	
R37	400Ω	10		1 3/4A-400	
R38	1000Ω	½		BTS-1000	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC ⓐ .62A	680CT ⓐ .07ADC	5VAC ⓐ 2A	6.3VAC ⓐ 2A		P9311 ①		PM8409 ①	24R05	R-14B

① Drill new mounting holes.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	7.5KΩ CT	16Ω Tap ⓐ							
	Tap ⓐ 68ΩCT RES.	8Ω 4Ω							

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	GROMMES PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L1	.079A	52Ω	1.46HY		C5040	C2994	C2327	26C41	C-21X ①

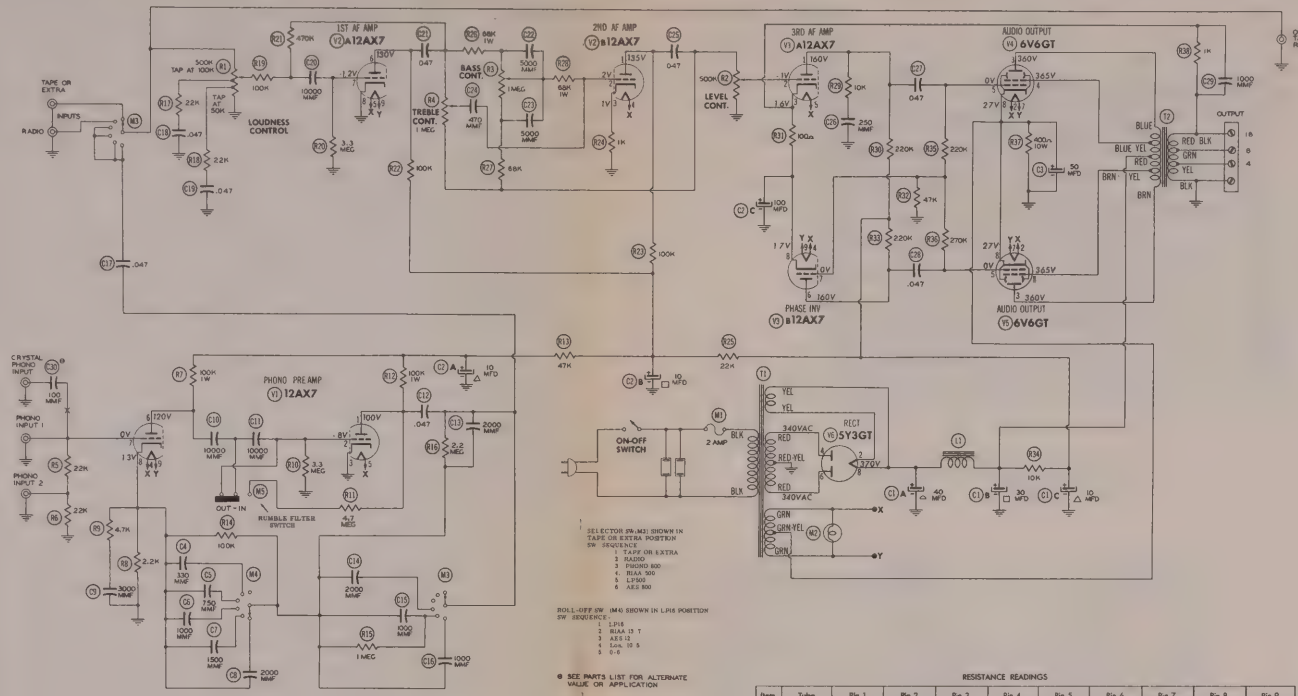
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			GROMMES PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	2A 250V			312002. (3AG2A)	342001	AGC2	HKP

MISCELLANEOUS

ITEM No.	PART NAME	GROMMES PART No.	NOTES
M2	Pilot Light		#51
M3	Switch		Selector-(Rotary-Wafer Type)
M4	Switch		Roll Off-(Rotary-Wafer Type)
M5	Switch		Rumble Filter (SPDT-Slide Type)



THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	† 179KΩ	3. 3Meg ≈ 680KΩ 500KΩ	0Ω	400Ω	400Ω	† 179KΩ	44KΩ	2. 2KΩ	400Ω
V 2	12AX7	† 132KΩ	1KΩ	400Ω	400Ω	† 132KΩ	3. 3Meg	0Ω	400Ω	
V 3	12AX7	† 230KΩ	0Ω	1KΩ	400Ω	400Ω	† 230KΩ	47KΩ	1. 1KΩ	400Ω
V 4	6V6GT	NC	400Ω	† 300Ω	† 90Ω	287KΩ	TP	400Ω	400Ω	
V 5	6V6GT	NC	400Ω	† 300Ω	† 90Ω	317KΩ	TP	400Ω	400Ω	
V 6	5Y3GT	NC	500KΩ	NC	140Ω	NC	140Ω	NC	500KΩ	

† MEASURED FROM PIN 8 OF V6.
≈ BASS, TREBLE, AND LOUDNESS CONTROLS IN EXTREME CLOCKWISE POSITION.
ALL MEASUREMENTS TAKEN WITH FUNCTION SELECTOR AND ROLL-OFF SWITCHES IN EXTREME COUNTER-CLOCKWISE POSITION.
NC-NO CONNECTION.
TP-TIE POINT.

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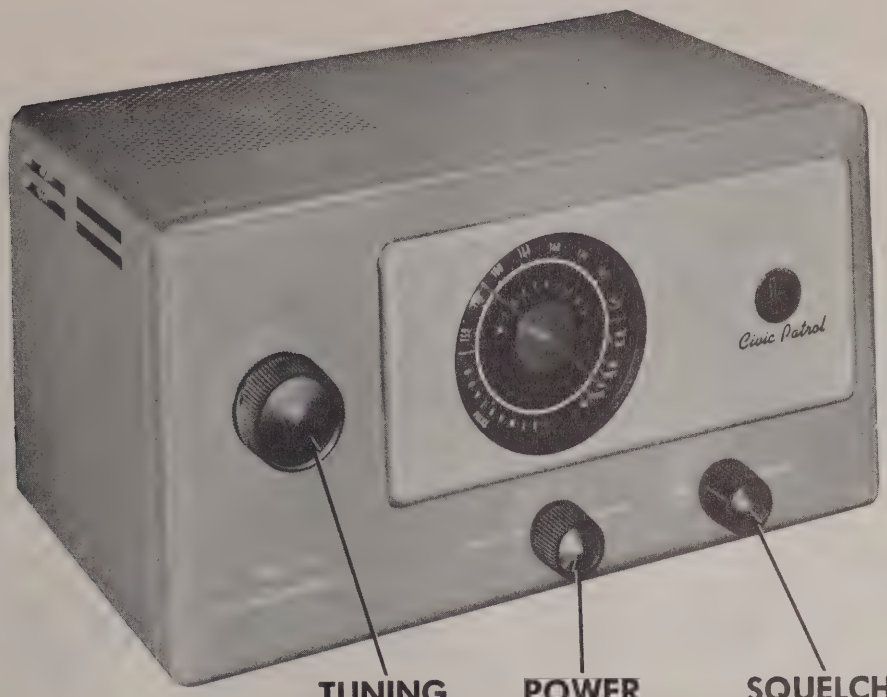
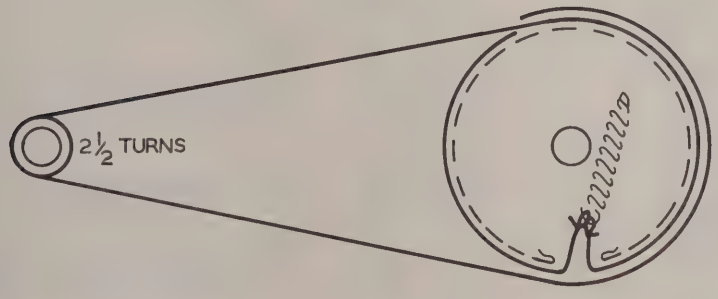
HALLICRAFTERS
MODEL S-95 (Run 1)



HALLICRAFTERS
MODEL S-95 (Run 1)

TRADE NAME	Hallicrafters Model S-95 (Run 1)
MANUFACTURER	Hallicrafters Co., 4401 W. 5th Ave. Chicago 24, Ill.
TYPE SET	AC-DC Operated FM Superheterodyne Receiver
TUBES (Eight)	Types 6AB4 RF Amp., 12AT7 Mixer-Osc., 12BA6 1st IF Amp., 12BA6 2nd IF Amp., 12AL5 Ratio Det., 6BH6 AF Amp., 50L6GT Output, 12AU7 Squelch
POWER SUPPLY	105-125 Volts AC-DC RATING .32 Amp. @ 117 Volts AC
TUNING RANGE—	FREQ. MOD. 152MC-173MC

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING

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DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		Hallicrafters PART No.	STANDARD REPLACEMENT	
V1	RF Amplifier	6AB4	6AB4	
V2	Mixer-Oscillator	12AT7	12AT7	
V3	1st. IF Amplifier	12BA6	12BA6	
V4	2nd. IF Amplifier	12BA6	12BA6	
V5	Ratio Detector	12AL5	12AL5	
V6	AF Amplifier	6BH6	6BH6	
V7	Output	50L6GT	50L6GT	
V8	Squelch	12AU7	12AU7	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Hallicrafters PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	45B091	AFH4-35	BBRQ55515C	WQ250	CDB-442	CST-534	R2199 *
B	40	150					TD-80-150	FM-1540	TVA-1413
C	40	150							
D	20	25							
C2	10	150	45C097	PRS150V10	BR1015	TC42	TD-10-150	FM-1512	TVA-1406
C3	2	50	45B192	PRS50V2	BBR2-50	TC302	TD-2-50	MMT-0505	TVA-1301

* Unit must be ordered from Manufacturer.

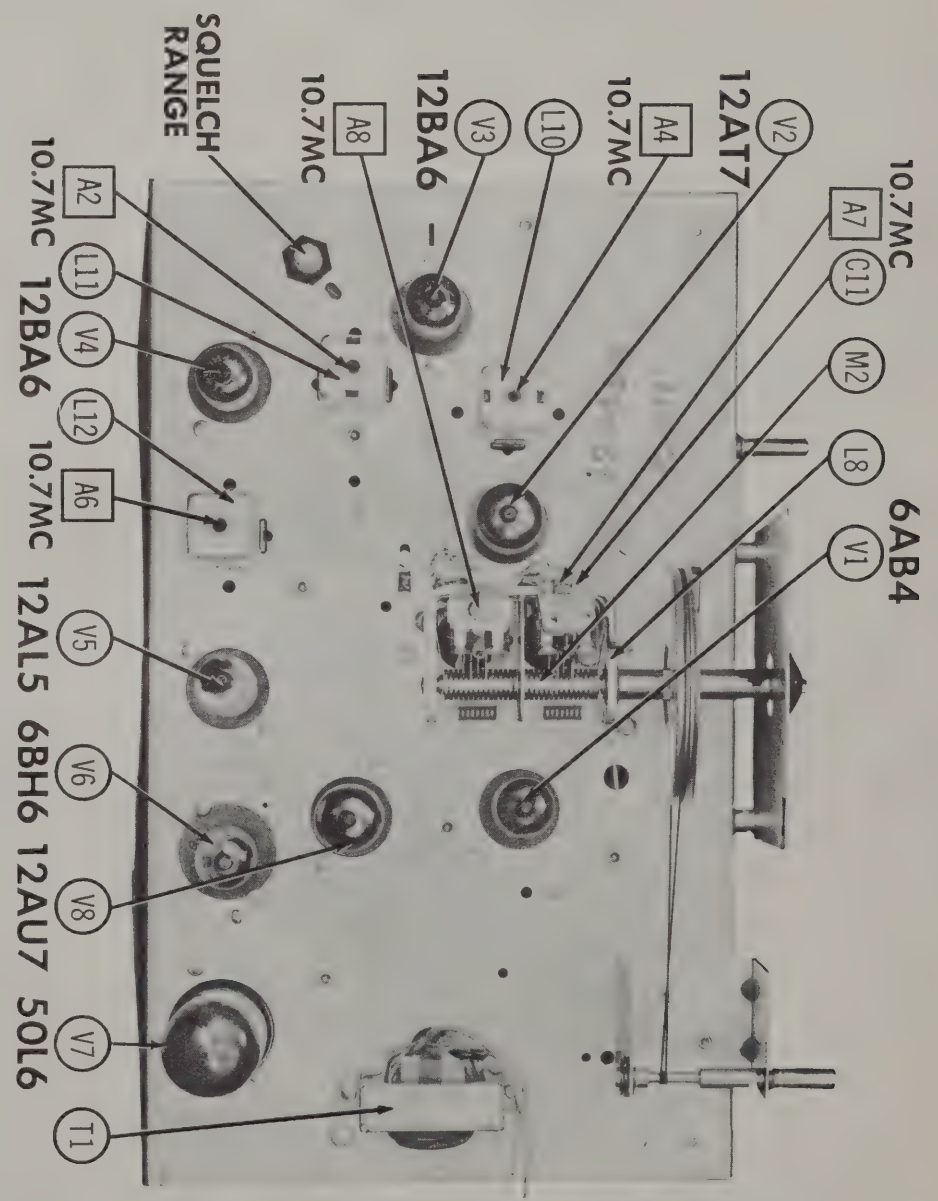
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Hallicrafters PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C4	330		47CA25331K5							
C5	330		47CA25331K5							
C6	330		47CA25331K5							
C7	330		47CA25331K5							
C8	.68		47B403-1		TCZ-R68	TZ02	NP0A-0R68			Note 1
C9	.68		47B403-1		TCZ-R68	TZ02	NP0A-0R68			Note 1
C10	47		47X20UK470K	N750-SI47	TCN-47	TN14	N750K-470	NT-5447	5TCU-Q47	
C11	4-20		44A115		822-EN		TS2A-4	ST-554-N		
C12	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C13	33		47X25CJ330J	NP0-SI33	TCZ-33	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C14	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C15	10000		47A224	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C16	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C17	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C18	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C19	100		47X25UK101K	N750-SI100	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C20	100		47X25UK101K	N750-SI100	TCN-100	TN22	N750L-101	NT-531	5TCU-T1	
C21	1000		47B230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C22	10000		47A224	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C23	330		47CA25331K5							
C24	330		47CA25331K5							
C25	20000		47A242	BPD-02	DD-203	K085	817-02		5HK-S2	
C26	10000		47A224	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C27	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C28	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C29	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C30	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C31	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C32	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C33	1000		47B230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C34	1000		47B230	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C36	5000		47A168	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37	.05	600	46BR473L6	BPD-05	DF-503	CUB6S5		PT615	6TM-S5	

Note 1. When replacing C8 and C9, do not twist leads together. Replace separately.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Hallicrafters PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	25B1115	AB-76	A47-2Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-9	RS-2	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	KB-1	SWE-12	76-1	US-26	Attach to R1A
R2A	50KΩ	½	25B1114	AB-34		Q14-123	U-34	Squelch
B	Shaft		Not Req.	AK-9		Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	KB-1		76-1	US-26	Attach to R2A
R3A	650Ω	1	23A1113	V-128	A43-750	W-750	R750L	Squelch Range (wire wound)
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R3A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R4	10KΩ	½	23X20X103K	BTS-10K	
R5	10KΩ	½	23X20X103K	BTS-10K	
R6	10KΩ	½	23X20X103K	BTS-10K	
R7	1000Ω	½	23X20X102K	BTS-1000	
R8	1000Ω	½	23X20X102K	BTS-1000	
R9	1000Ω	½	23X20X102K	BTS-1000	
R10	1000Ω	½	23X20X102K	BTS-1000	
R11	100Ω	½	23X20X101K	BTS-100	
R12	1000Ω	½	23X20X102K	BTS-1000	
R13	100Ω	½	23X20X101K	BTS-100	
R14	47KΩ	½	23X20X473K	BTS-47K	
R15	2.2Meg	½	23X20X225K	BTS-2.2Meg	
R16	270KΩ	½	23X20X274K	BTS-270K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	Hallicrafters PART No.	IRC PART No.	
R17	1Meg	½	23X20X105K	BTS-1Meg	
R18	470KΩ	½	23X20X474K	BTS-470K	
R19	100Ω	½	23X20X101K	BTS-100	
R20	100Ω	½	23X20X101K	BTS-100	
R21	270KΩ	½	23X20X274K	BTS-270K	
R22	1200Ω	½	23X20X122K	BTS-1200	
R23	10KΩ	2	23X40X103K	BTB-10K	
R24	470Ω	½	23X20X471K	BTS-470	
R25	22Ω	1	20X150K		
R26	220Ω	2	23X40X221K		
R27	470Ω	1	23X30X471K	BTA-470	
R28	270Ω	1	23X30X271K	BW1-270	

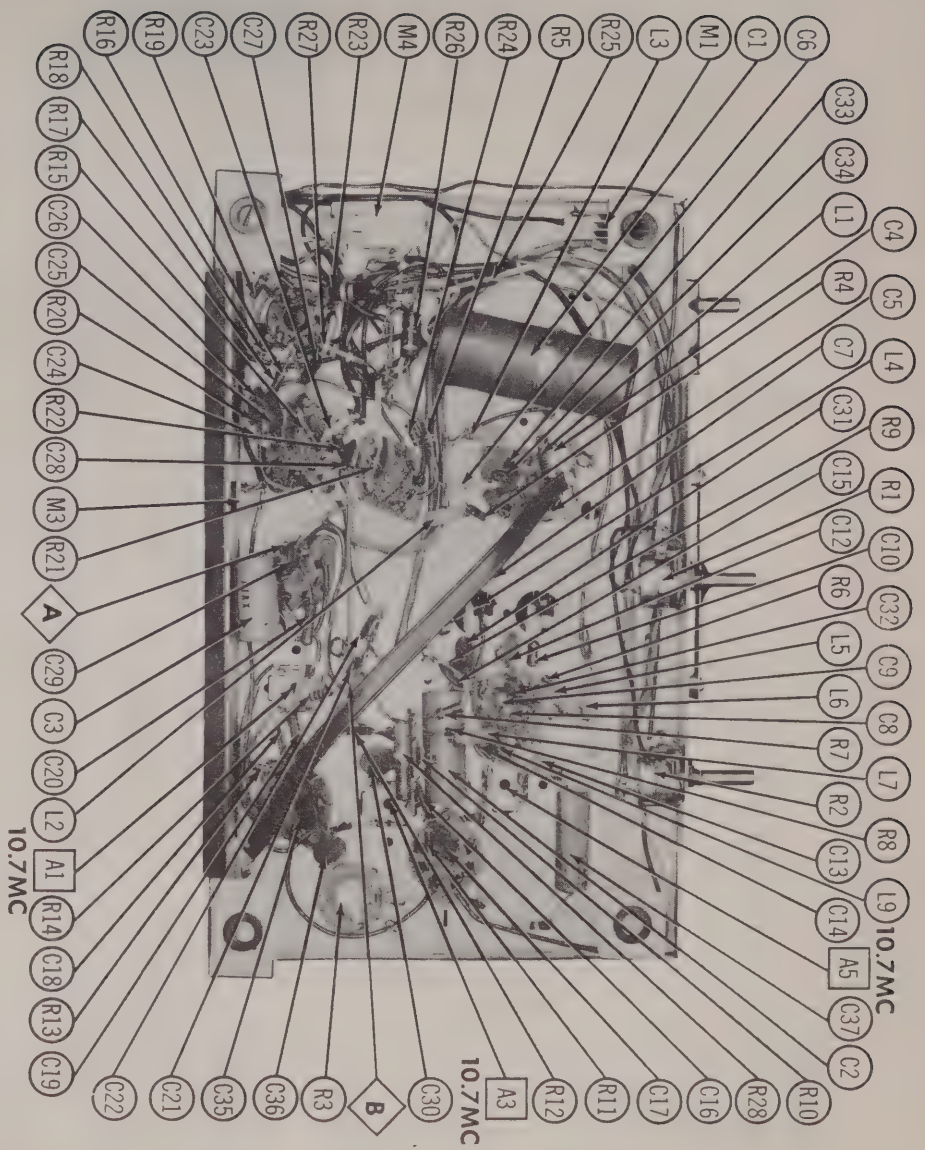
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Hallicrafters PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.4KΩ	3-4Ω RES. 1.98Ω tap ④ .95Ω	55B127 55A127 ①						① Alternate audio output.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	Hallicrafters PART No.	QUAM PART No.	RCA TYPE No.	
SP1	5"	PM	3-4Ω	85C120	5A1	228S1	

CHASSIS—BOTTOM VIEW



COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Hallicrafters PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω		51A1894				
L2	Fil. Choke	3Ω		53A240	19-1003		4608	3.3 Microhenries (IRC part #CLA)
L3	Fil. Choke	3Ω		53A240	19-1003		4608	3.3 Microhenries (IRC part #CLA)
L4	FM RF Coil	0Ω		51A1472				
L5	Cathode Choke	1.8Ω		53A238	19-1002		4606	2.2 Microhenries (IRC part #CLA)
L6	Fil. Choke	3Ω		53A240	19-1003		4608	3.3 Microhenries (IRC part #CLA)
L7	Fil. Choke	3Ω		53A240	19-1003		4608	3.3 Microhenries (IRC part #CLA)
L8	FM Osc. Coil	0Ω		51A1471				
L9	Parasitic Suppressor	0Ω		53A239				Wound on 4.7KΩ resistor
L10	1st. FM IF	1Ω	1Ω	50C519	16-3487	FM-251	1463	
L11	2nd. FM IF	1Ω	1Ω	50C517	16-3487	FM-251	1463	
L12	Ratio Det.	4.2Ω	.2ΩCT	50C518	17-3492	FM-255	1465	Tertiary winding -.9Ω

PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	Hallicrafters PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	
M1	.097A	27A161	1101A	RS100	6S100	5M1	100	

MISCELLANEOUS

ITEM No.	PART NAME	Hallicrafters PART No.	NOTES
M2	Tuning Cap.	48C278	2 Gang
M3	Switch	60A243	Speaker-Phones (SPDT-Slide Type)
M4	Relay	21B193	Squelch Control
	Cabinet	40C173	
	Knob	15B802	Tuning
	Knob	15B816	On-Off-Volume & Squelch
	Dial	83C404	
	Dial Pointer	82A277	
	Dial Window	22B345	

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Squelch control "off".

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two 470K resistors in series from point Ⓐ to chassis. Junction of these two resistors is point Ⓒ.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A1, A2, A3, A4, A5	Adjust for maximum deflection.
2.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A6	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2). Low side to chassis.	10.7MC (450KC Swp.)	Point of non-interference	Vert. Amp. to point Ⓐ. Low side to chassis.	A1, A2, A3, A4, A5	Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to point Ⓒ.	A6	Adjust so 10.7MC occurs at center of crossover lines similar to Fig. 2. Retouch A1 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
3.	270Ω Carbon Resistors	High side thru 270Ω to terminal "A" on antenna strip. Low side to "G".	170MC	170MC	DC probe to point Ⓐ. Common to chassis.	A7, A8	Adjust for maximum deflection. Rock tuning gang while adjusting A8.
4.	"	"	156MC	156MC	"		Check for calibration and tracking. Not necessary unless osc. coil has been replaced.

FIG. 1

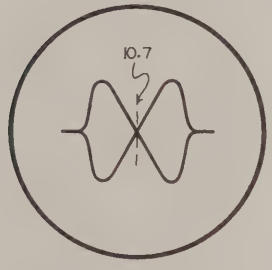
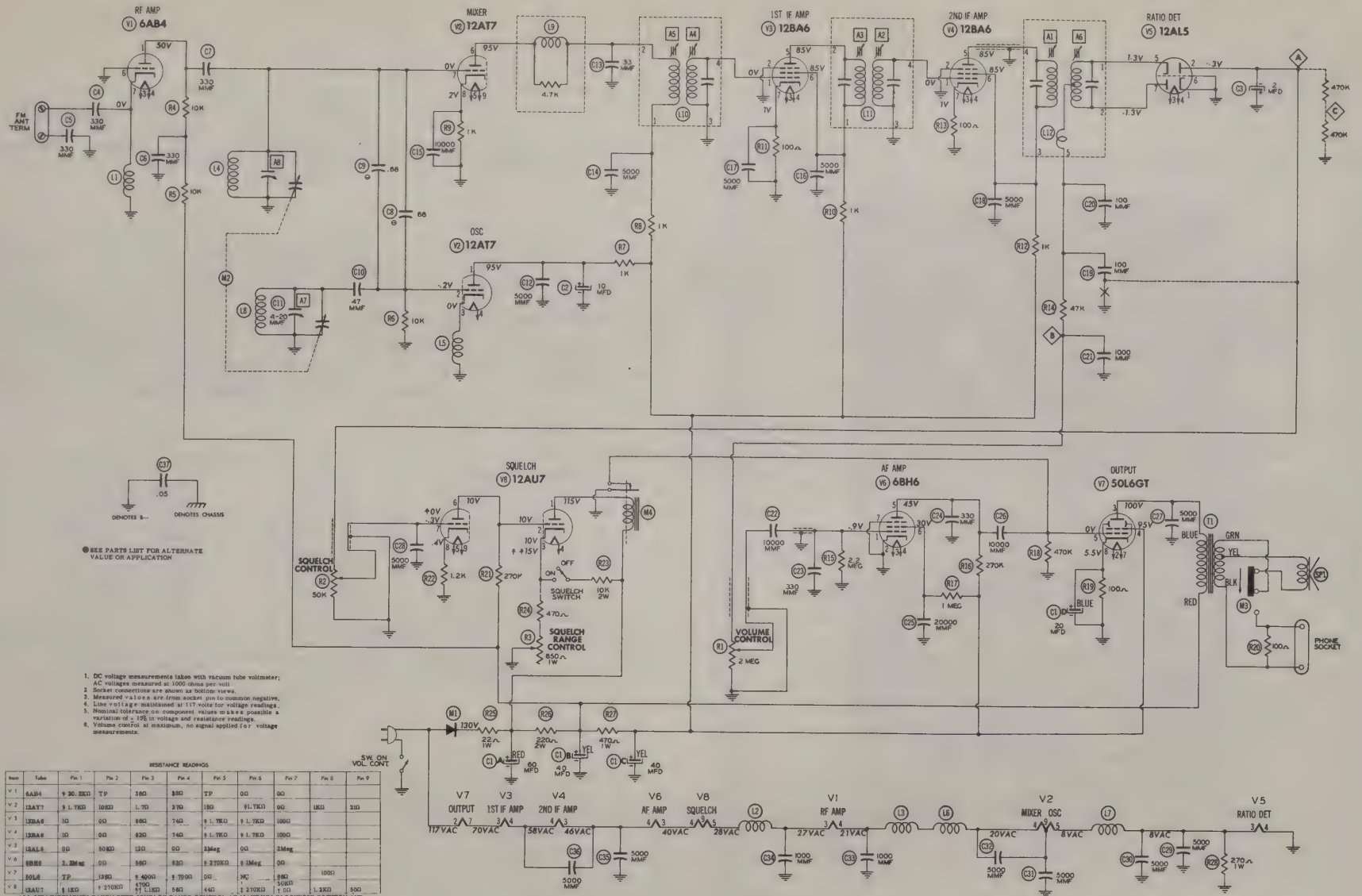


FIG. 2



● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AB4	† 30.5KΩ	TP	38Ω	$8Ω	TP	0Ω	0Ω		
V 2	12AT7	† 1.7KΩ	10KΩ	1.7Ω	27Ω	15Ω	†1.7KΩ	0Ω	1KΩ	21Ω
V 3	12BA6	1Ω	0Ω	86Ω	74Ω	† 1.7KΩ	† 1.7KΩ	100Ω		
V 4	12BA6	1Ω	0Ω	62Ω	74Ω	† 1.7KΩ	† 1.7KΩ	100Ω		
V 5	12AL5	0Ω	50KΩ	13Ω	0Ω	2Meg	0Ω	2Meg		
V 6	6BH6	1.22Meg	0Ω	96Ω	62Ω	† 270KΩ	† 1Meg	0Ω		
V 7	50L6	TP	13Ω	† 400Ω	† 700Ω	0Ω	NC	56Ω	100Ω	
V 8	12AU7	† 1KΩ	† 270KΩ	470Ω †† 1.1KΩ	56Ω	44Ω	† 270KΩ	50KΩ † 0Ω	1.2KΩ	50Ω

ALL MEASUREMENTS TAKEN WITH SQUELCH RANGE CONTROL AT MAXIMUM CLOCKWISE POSITION AND SQUELCH CONTROL AT MAXIMUM COUNTER CLOCKWISE POSITION UNLESS DESIGNATED OTHERWISE.
† SQUELCH CONTROL AT MAXIMUM CLOCKWISE POSITION.
†† SQUELCH RANGE CONTROL AT MAXIMUM COUNTER-CLOCKWISE POSITION.
◊ MEASURED FROM OUTPUT OF M1.
NC - NO CONNECTION.
TP - TIE POINT.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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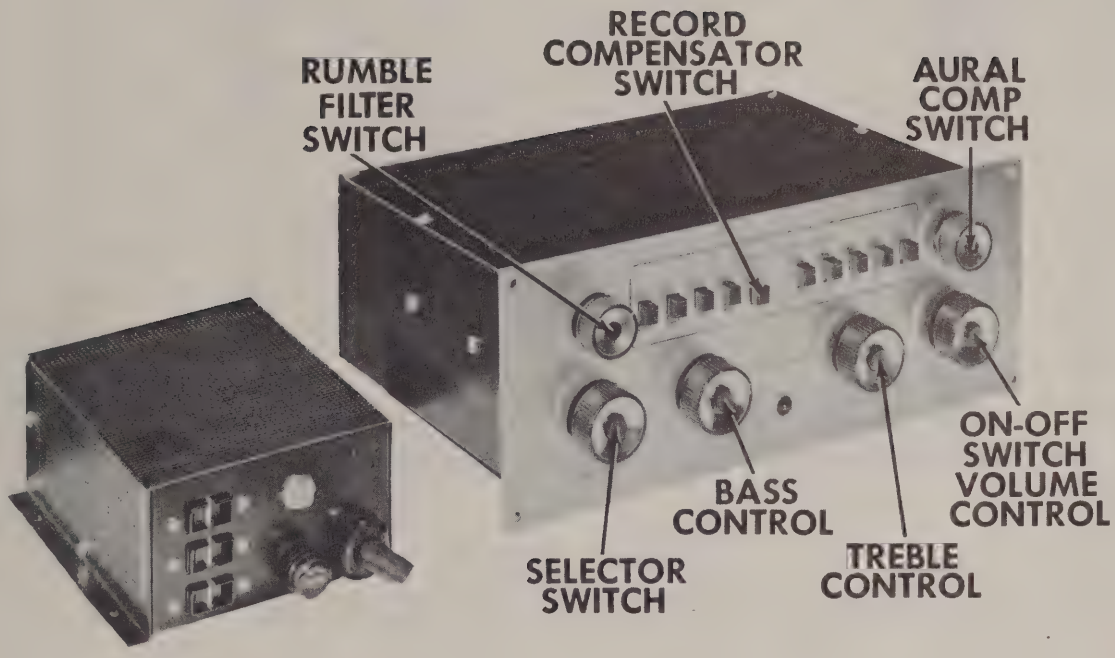
FM IF = 10.7 MC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

MC INTOSH MODELS
C-8, C-8P, D-8



MC INTOSH MODELS
C-8, C-8P, D-8

TRADE NAME	McIntosh Models C-8, C-8P, D-8 (Power Supply for Model C-8P)
MANUFACTURER	McIntosh Laboratory Inc., 320 Water St., Binghamton, N. Y.
TYPE SET	AC Operated 5 Channel Equalizer Preamplifier
TUBES (Four)	Types 12AX7 1st AF Amplifier-2nd AF Amplifier, 12AX7 1st Cathode Follower-2nd Cathode Follower, 12AX7 3rd AF Amplifier-3rd Cathode Follower, 5Y3GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .21 Amp. @ 117 Volts AC

PROPERTY OF
L. F. BLANKENSHIP
3624 MEADE ST.
DENVER, COLORADO

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: MC INTOSH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	1st AF Amp. -2nd AF Amp.	12AX7	12AX7	
V2	1st Cathode Follower-2nd Cathode Follower	12AX7	12AX7	
V3	3rd AF Amp. -3rd Cathode Follower	12AX7	12AX7	
V4	Rectifier	5Y3GT	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	MC INTOSH PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	10	450		PRS450V10	BR1045	TC72	TD-10-450	FM-4510	TVA-1705
C2A	● 20	450			BO43	TCT3432	TM-D30-300	D-225	TVL-2759
B	▲ 30	250			BR2045		TD-20-450	FM-4520	TVA-1709
C	■ 30	300							
C3	50	6		SRE6V50	BBR50-6	TC29	TD-50-6	MMT-650	TVA-1100

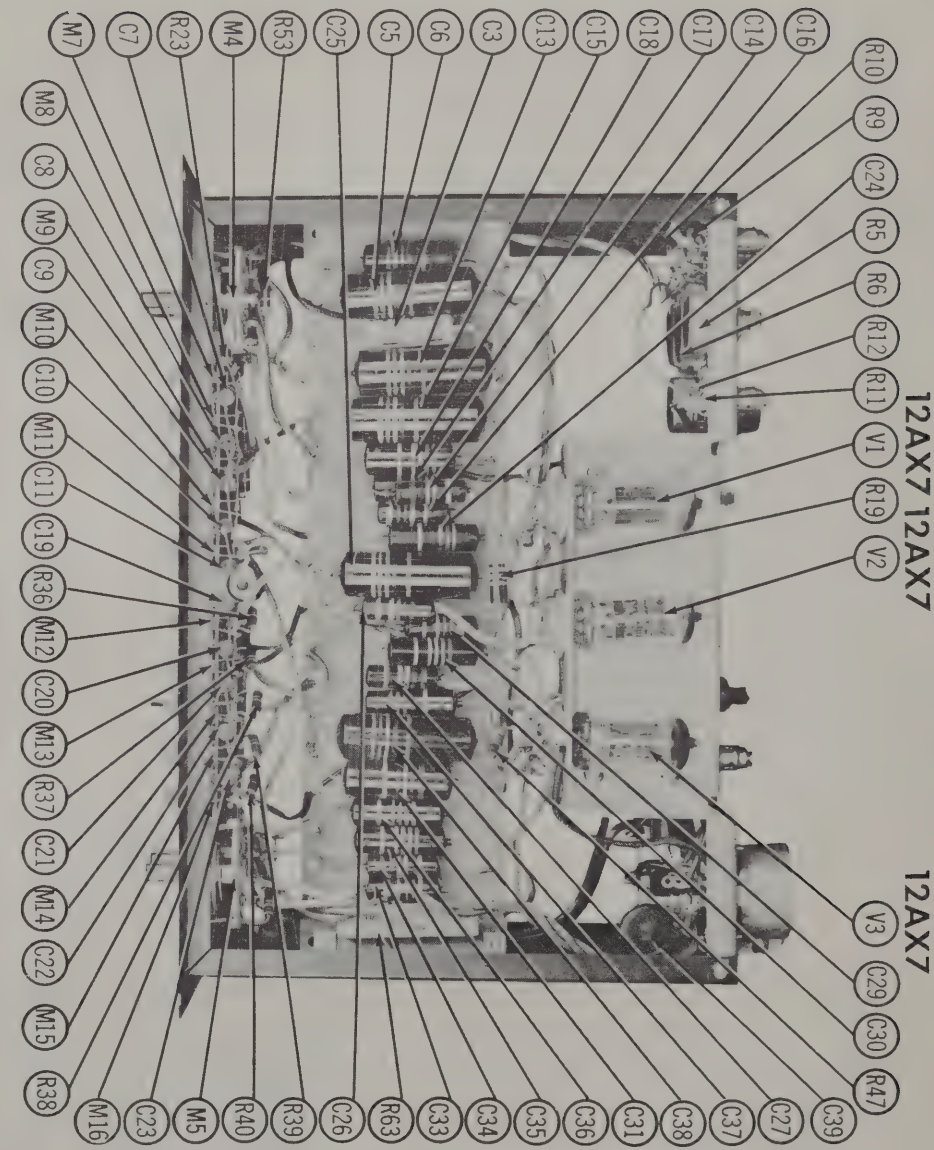
FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	MC INTOSH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C5	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C6	.033	400		BPD-03	DF-303	CUB6S33		PT6133	6TM-S33	
C7	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C8	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C9	750			SI750	D6-751	TP51	GP2L-751	UC-5375	5GA-T75	
C10	1000			SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C11	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C12	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C13	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C14	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C15	.0047	400		1464-0047		1R5D47			MS-247	
C16	.01	400								
C17	.022	400								
C18	.047	400								
C19	220			SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C20	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C21	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C22	750			SI750	D6-751	TP51	GP2L-751	UC-5375	5GA-T75	
C23	1500			SI1500	D6-152	TP54	GP2L-152	UC-5215	5HK-D15	
C24	.033	400		BPD-03	DF-303	CUB6S33		PT4133	6TM-S33	
C25	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C26	.001	400		1464-001		1R5D1		MCB255	MS-21	
C27	.01	400								
C28	100			SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C29	.0022	400		1464-0022		1R5D22			MS-222	
C30	.022	400								
C31	.1	400		P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C32	330			SI330	D6-331	TP43	GP2K-331	UC-5333	5GA-T33	
C33	.0047	400		1464-0047		1R5D47		MCB465	MS-247	
C34	.01	400								
C35	.022	400								
C36	.022	400								
C37	.033	400		BPD-03	DF-303	CUB6S33		PT4133	6TM-S33	
C38	.47	200		P288N-47		CUB2P47		PT4047	2TM-P47	
C39A	10000			BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C40	4700			BPD-0047	DD-472	KO79	811-0047	DC-525	5HK-D47	Note 1
C41A	10000			BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		

Note 1. Not used in some versions.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MC INTOSH PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1Meg	½		AB-70	A47-1Meg-Z	Q13-137	U-53	Bass
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.
R2A	250KΩ	½		AB-51	A47-250K-Z	Q13-130	U-44	Treble
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R2A.
R3A	250KΩ	½		AB-51	A47-250K-Z	Q13-130	U-44	Volume
B	Shaft			AK-4	KSS-3	Not Req.	Not Req.	Attach to R3A.
C	Switch			KB-2	SWE-20	76-2	US-27	Attach to R3A.
R4A	100KΩ	½		AB-40	A47-100K-S	Q11-128	U-41	Load
B	Shaft			AK-9	RS-2	Not Req.	Not Req.	Attach to R4A.
R5A	100KΩ	½		AB-41	A47-100K-Z	Q13-128	U-39	Input #1 Level
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	100KΩ	½		AB-41	A47-100K-Z	Q13-128	U-39	Input #2 Level
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R6A.
R7A	100KΩ	½		AB-41	A47-100K-Z	Q13-128	U-39	Input #3 Level
B	Shaft			AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R7A.
R8A	250Ω	½		AB-2		Q11-201	U-2	Hum Adjustment
B	Shaft			AK-1		Not Req.	Not Req.	Attach to R8A.

RESISTORS

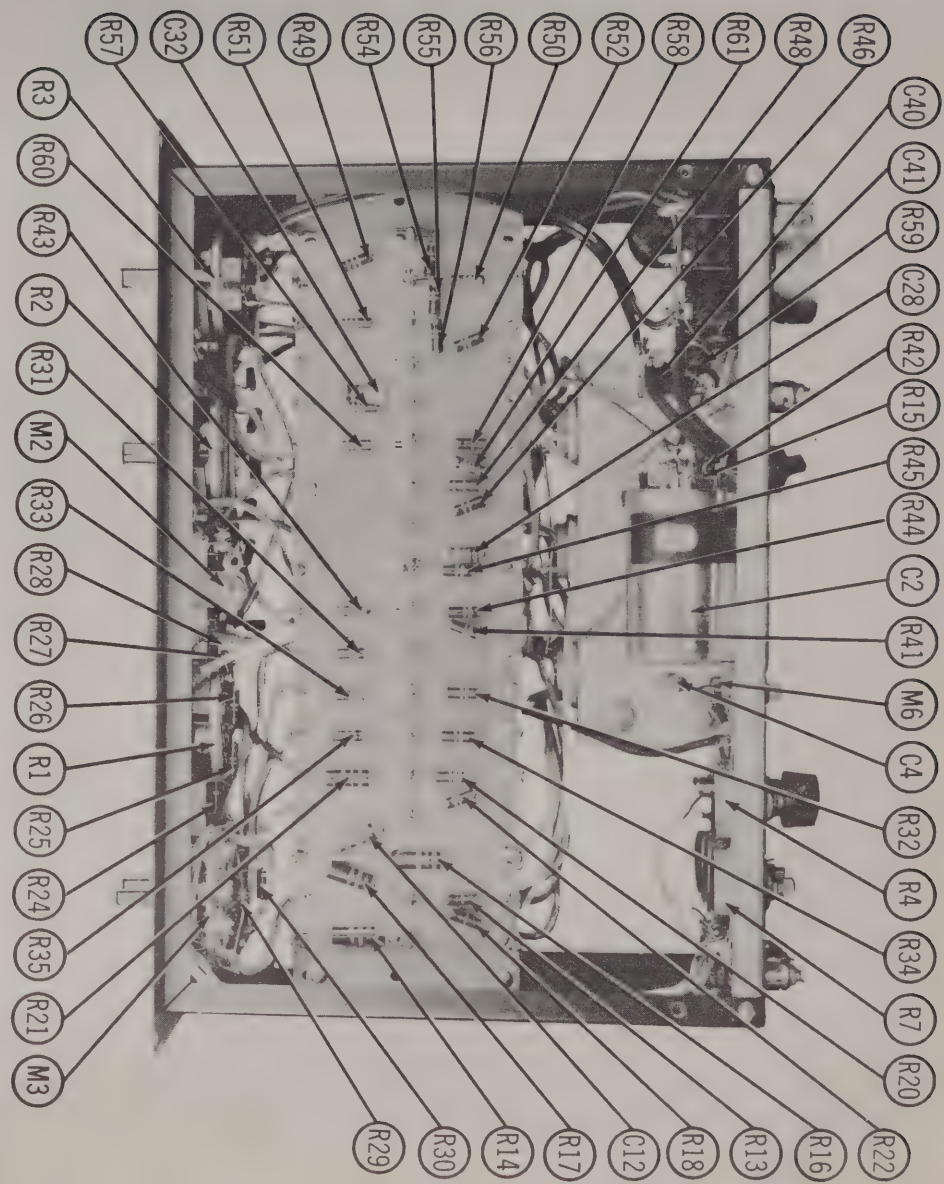
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MC INTOSH PART No.	IRC PART No.	
R9	560KΩ	½		BTS-560K	
R10	560KΩ	½		BTS-560K	
R11	18KΩ	½		BTS-18K	
R12	10KΩ	½		BTS-10K	
R13	1Meg	½		BTS-1Meg	
R14	220KΩ	1		BTA-220K	
R15	100KΩ	½		BTS-100K	
R16	3300Ω	1		BTA-3300	
R17	750Ω 5%	1		BTA-750 5%	
R18	1Meg	½		BTS-1Meg	
R19	330KΩ	1		BTA-330K	
R20	330KΩ	½		BTS-330K	
R21	1800Ω	1		BTA-1800	
R22	100KΩ	½		BTS-100K	
R23	22Meg	½		BTS-22Meg	
R24	22Meg	½		BTS-22Meg	
R25	22Meg	½		BTS-22Meg	
R26	22Meg	½		BTS-22Meg	
R27	22Meg	½		BTS-22Meg	
R28	22Meg	½		BTS-22Meg	
R29	22Meg	½		BTS-22Meg	
R30	3.9Meg	½		BTS-3.9Meg	
R31	100KΩ	½		BTS-100K	
R32	680KΩ	½		BTS-680K	
R33	330KΩ	½		BTS-330K	
R34	220KΩ	½		BTS-220K	
R35	1Meg	½		BTS-1Meg	
R36	10Meg	½		BTS-10Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MC INTOSH PART No.	IRC PART No.	
R37	10Meg	½		BTS-10Meg	
R38	10Meg	½		BTS-10Meg	
R39	10Meg	½		BTS-10Meg	
R40	10Meg	½		BTS-10Meg	
R41	100KΩ	½		BTS-100K	
R42	100KΩ	½		BTS-100K	
R43	1800Ω	½		BTS-1800	
R44	100KΩ	½		BTS-100K	
R45	100KΩ	½		BTS-100K	
R46	10KΩ	½		BTS-10K	
R47	330KΩ	½		BTS-330K	
R48	1800Ω	½		BTS-1800	
R49	180KΩ	½		BTS-180K	
R50	68KΩ 5%	½		BTS-68K 5%	
R51	33KΩ	½		BTS-33K	
R52	15KΩ	½		BTS-15K	
R53	680KΩ	½		BTS-680K	
R54	10Meg	½		BTS-10Meg	
R55	10Meg	½		BTS-10Meg	
R56	10Meg	½		BTS-10Meg	
R57	330KΩ	½		BTS-330K	
R58	1Meg	½		BTS-1Meg	
R59	12KΩ	2		BTB-12K	
R60	1800Ω	½		BTS-1800	
R61	100KΩ	½		BTS-100K	
R62	220KΩ	1		BTA-220K	
R63	2Ω	10		PW10-2	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MC INTOSH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC @ .21A	525VCT @ .0045A	5VAC @ 2A	6.3VAC @ .99A						

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

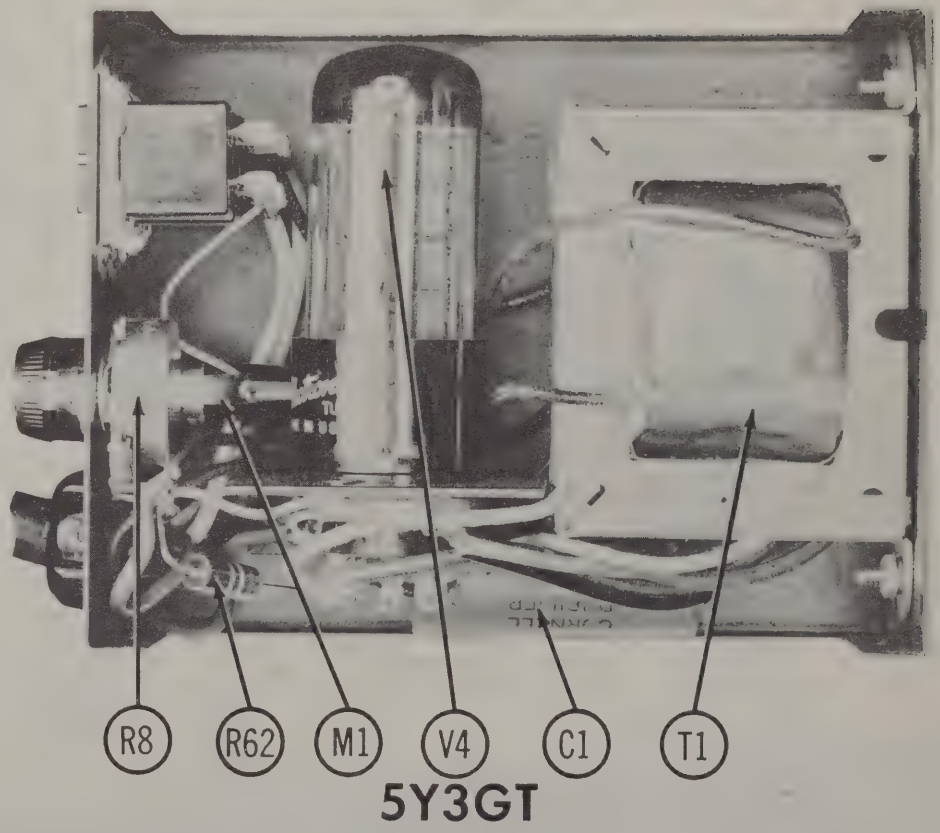
FUSES

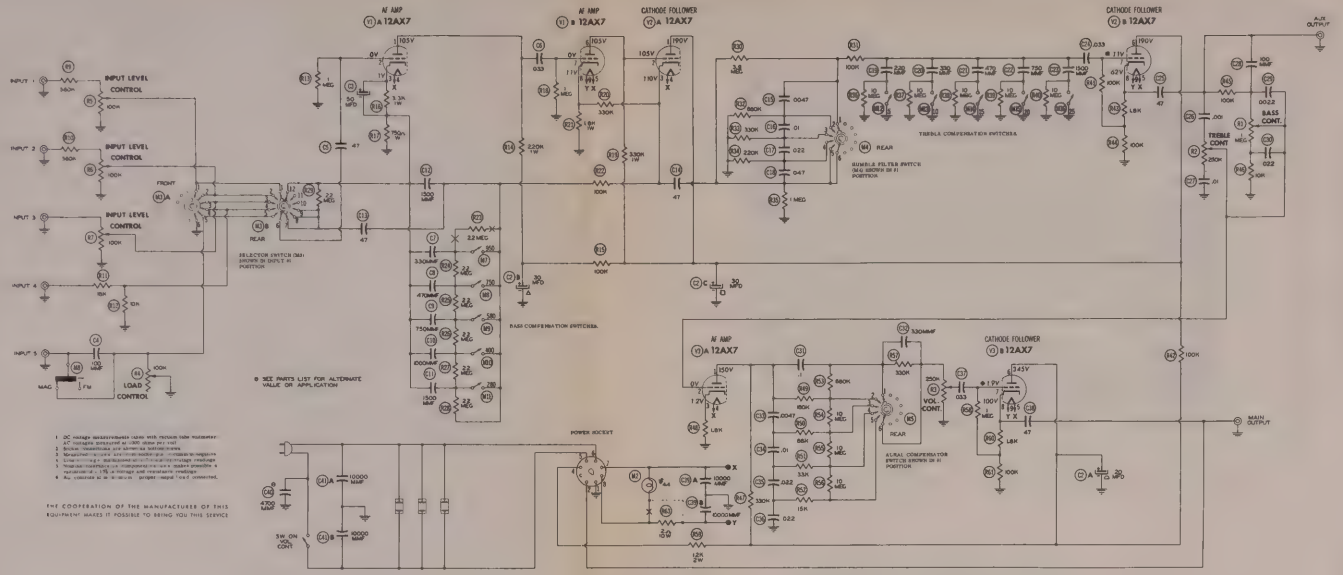
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			MC INTOSH PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG	½A 250V			312.500 (3AG ½A)	342001	AGC½	HKP

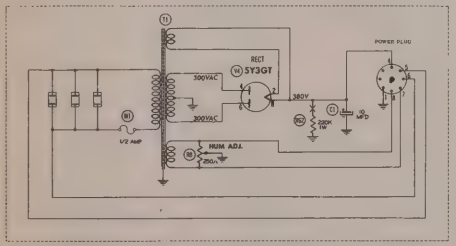
MISCELLANEOUS

ITEM No.	PART NAME	MC INTOSH PART No.	NOTES
M2	Pilot Light		#44
M3	Switch		Selector (DP-5 Position, Rotary, Wafer Type)
M4	Switch		Rumble Filter (SP-5 Position, Rotary, Wafer Type)
M5	Switch		Aural Compensator-(SP-5 Position, Rotary, Wafer Type)
M6	Switch		FM-Mag. (SPST-Slide Type)
M7	Switch		Record Compensator-Bass (950), SPST-Slide Type
M8	Switch		Record Compensator-Bass (750), SPST-Slide Type
M9	Switch		Record Compensator-Bass (580), SPST-Slide Type
M10	Switch		Record Compensator-Bass (400), SPST-Slide Type
M11	Switch		Record Compensator-Bass (280), SPST-Slide Type
M12	Switch		Record Compensator-Treble (5), SPST-Slide Type
M13	Switch		Record Compensator-Treble (10), SPST-Slide Type
M14	Switch		Record Compensator-Treble (15), SPST-Slide Type
M15	Switch		Record Compensator-Treble (20), SPST-Slide Type
M16	Switch		Record Compensator-Treble (25), SPST-Slide Type

CHASSIS - POWER SUPPLY







RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	↑ 432KΩ	1Meg	4KΩ	60Ω	60Ω	↑ 442KΩ	1Meg	1.8KΩ	60Ω
V 2	12AX7	↑ 112KΩ	↑ 442KΩ	331KΩ	60Ω	60Ω	↑ 112KΩ	200KΩ	101KΩ	60Ω
V 3	12AX7	↑ 343KΩ	101KΩ	1.8KΩ	60Ω	60Ω	↑ 12KΩ	1.1Meg	101KΩ	60Ω
V 4	5Y3GT	NC	100KΩ	NC	900Ω	NC	900Ω	NC	100KΩ	

ALL MEASUREMENTS TAKEN WITH SELECTOR, RUMBLE FILTER, AND AURAL COMPENSATION SWITCHES IN MAXIMUM COUNTER-CLOCKWISE POSITION.
↑ MEASURED FROM PIN 8 OF V4.
● MEASURED FROM PIN 8 OF V2.
+ MEASURED FROM PIN 8 OF V3.
NC-NO CONNECTION.

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PHOTOFACT* Folder

*TRADE MARK

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

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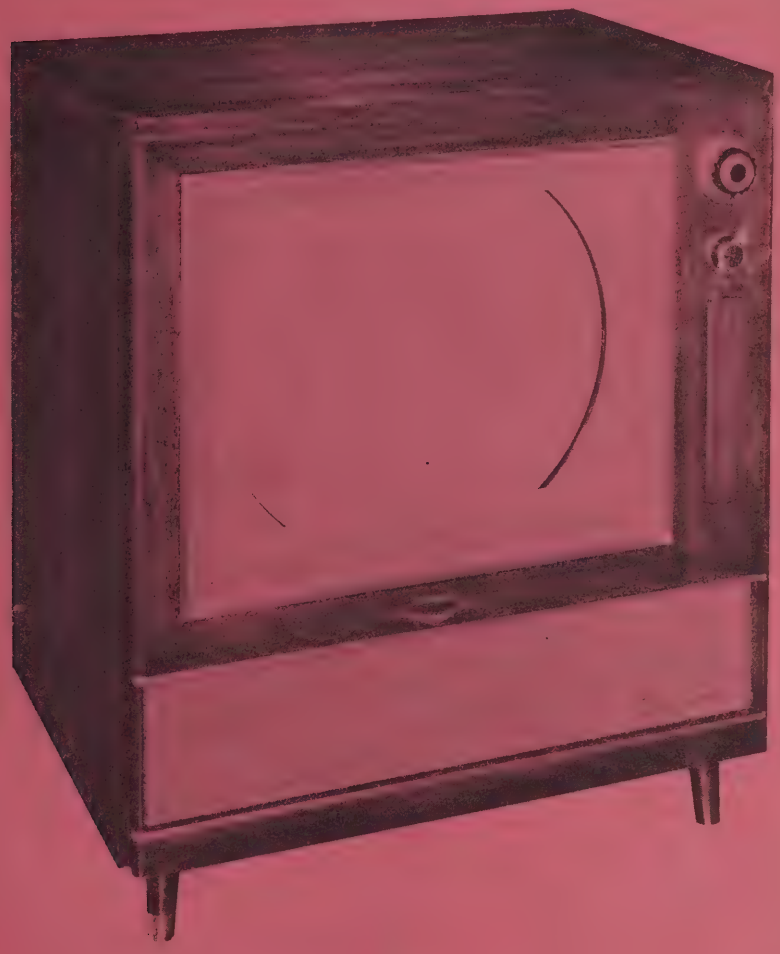

MODEL 21-CT-662U

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

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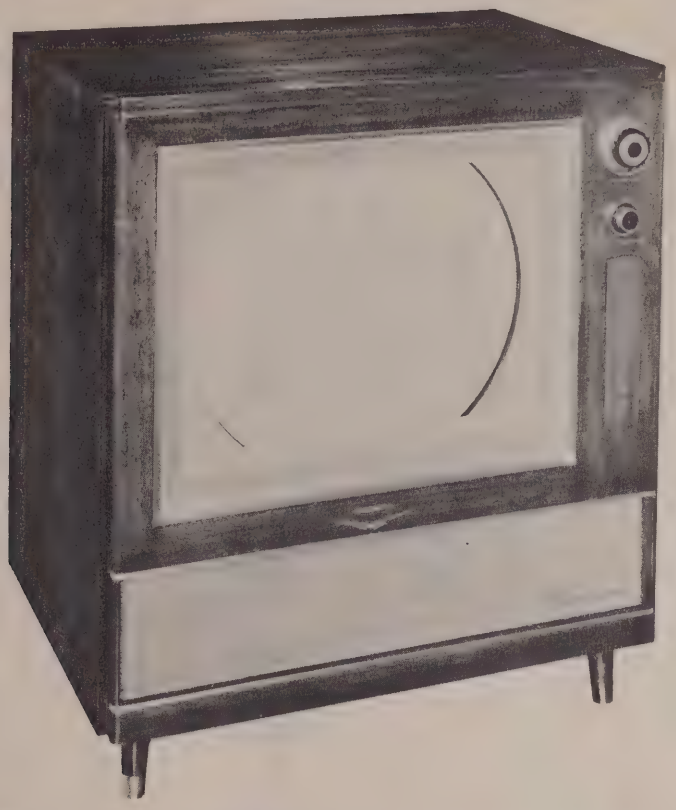
RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)



RCA Victor Model 21-CT-662U (Ch. CTC4A)

TRADE NAME	RCA Victor Models 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4 or CTC4A)
MANUFACTURER	Radio Corporation of America, RCA Victor Television Division, Camden, N. J.
TYPE SET	Color Television Receiver
TUBES	Twenty-six
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 3.6 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions ..... 5 thru 9
Block Diagram 3
Drive Cord Stringing (UHF) 31
Disassembly Instructions 33
Miscellaneous Adjustments 20, 29
Parts List and Descriptions ..... 22 thru 27
Photographs
- Cabinet-Rear View 33
- Capacitor Identification 12, 17
- Chassis-Top View 14, 15
- Convergence Chassis 31
- Printed Circuit Sub-Chassis (Sound IF) 10
- Printed Circuit Sub-Chassis (Video IF) 10
- RF Tuner 21, 28
- Resistor Identification (R1-R142) 11, 18
- Resistor Identification (R143-R232) 13, 16
- Trans., Inductor & Alignment Identification 32

Resistance Measurements 4
Schematic (Alternate Convergence Circuit) 29
Schematic (TV) 2
Schematic (RF Tuner) 30
Tube Placement Chart (Bottom View) 9
Tube Placement Chart (Top View) 19

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

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G154

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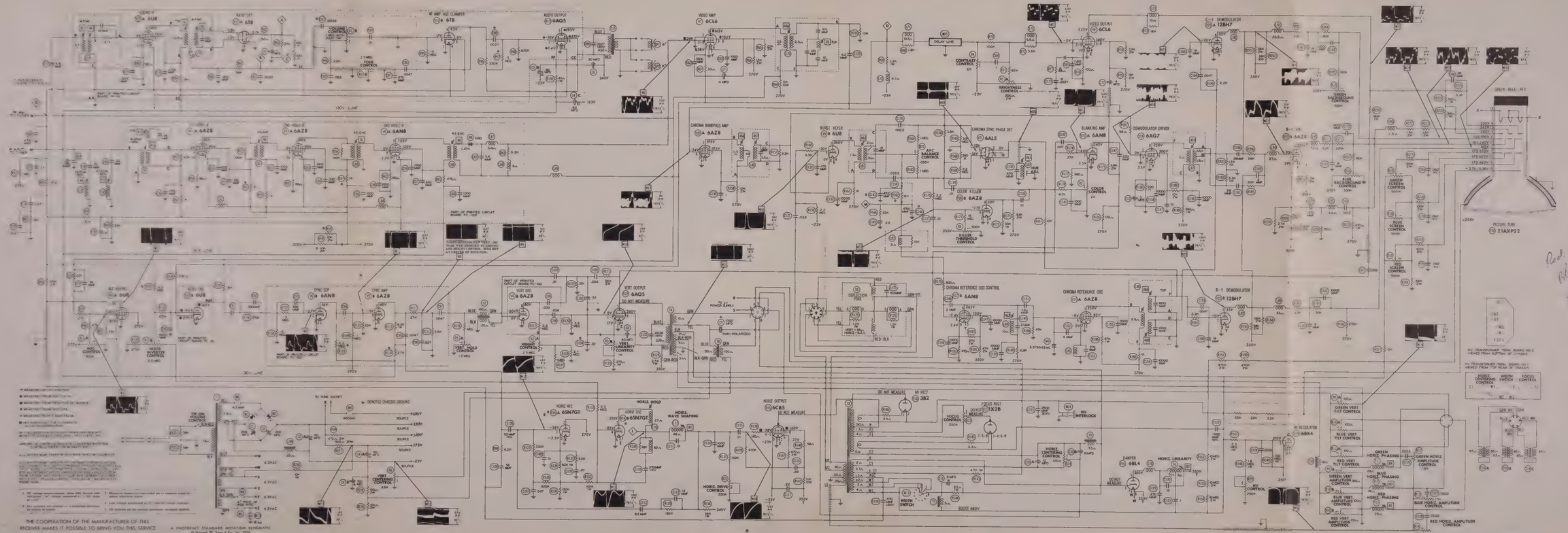


RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

BLOCK DIAGRAM

RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4A	*† 20KΩ	8KΩ	0Ω	. 1Ω	0Ω	8KΩ	*† 20KΩ		
V 2	6BQ7A	† 2. 5KΩ	500KΩ	600KΩ	0Ω	. 1Ω	600KΩ	250KΩ	120Ω	0Ω
V 3	6X8	0Ω	100KΩ	† 14KΩ	. 1Ω	0Ω	0Ω	100KΩ	† 19KΩ	† 19KΩ
V 4	6AZ8	† 7KΩ	† 7KΩ	68Ω	. 1Ω	0Ω	35KΩ	120Ω	▲ 4Meg	1. 6Meg
V 5	6AZ8	† 7KΩ	† 7KΩ	68Ω	. 1Ω	0Ω	35KΩ	0Ω	■ 11KΩ	33KΩ
V 6	6AN8	■ 2. 2Meg	3Meg	0Ω	. 1Ω	0Ω	■ 470Ω	■ 470Ω	. 2Ω	180Ω
V 7	6CL6	900Ω	4. 2KΩ	† 12KΩ	. 1Ω	0Ω	† 5. 5KΩ	0Ω	† 12KΩ	4. 2KΩ
V 8	6CL6	100Ω	50KΩ	† 15KΩ	. 1Ω	0Ω	† 5KΩ	0Ω	† 15KΩ	50KΩ
V 9	6U8	† 1. 5KΩ	■ 25KΩ	† 500Ω	. 1Ω	0Ω	250KΩ	25KΩ	3. 5Ω	2. 2Meg
V 10	6U8	† 24KΩ	47KΩ	■ 1. 8KΩ	. 1Ω	0Ω	■ 1. 8KΩ	120Ω	1. 2KΩ	1. 8Meg
V 11	6T8	INF	27KΩ	INF	. 1Ω	0Ω	250KΩ	0Ω	10Meg	† 330KΩ
V 12	6AQ5	600KΩ	25KΩ	0Ω	. 1Ω	† 900Ω	† 470Ω	600KΩ		
V 13	6AQ5	2. 2Meg	500Ω	0Ω	. 1Ω	† 2. 7KΩ	† 2. 5KΩ	2. 2Meg		
V 14	6SN7GT	1. 3Meg	† 500Ω	230KΩ	250KΩ	† 39KΩ	0Ω	. 1Ω	0Ω	
V 15	6CB5	† 11KΩ	. 1Ω	200Ω	470KΩ	470KΩ	200Ω	0Ω	† 11KΩ	TOP CAP ▲ 60Ω
V 16	6BL4	† 3. 5Ω	NC	200KΩ	NC	† 3. 5Ω	NC	† 2Ω	† 2Ω	
V 17	1X2B	30Meg	30Meg	NC	30Meg	30Meg	30Meg	TP	30Meg	TOP CAP ▲ 80KΩ
V 18	3B2		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 570Ω
V 19	6BK4	8KΩ	† 11KΩ	8KΩ	8KΩ	1. 2Meg	NC	† 11KΩ	8KΩ	TOP CAP INF
V 20	6AZ8	† 11KΩ	† 11KΩ	0Ω	. 1Ω	0Ω	560KΩ	0Ω	† 20KΩ	3. 5Meg
V 21	6AL5	. 2Ω	. 2Ω	. 1Ω	0Ω	2. 5Meg	0Ω	1. 8Meg		
V 22	6AN8	† 5KΩ	27KΩ	560Ω	0Ω	. 1Ω	† 2. 7KΩ	† 20KΩ	2Meg	470Ω
V 23	6AZ8	† 1. 5KΩ	† 47KΩ	. 4Ω	. 1Ω	0Ω	47KΩ	2. 7KΩ	† 15KΩ	† 60KΩ
V 24	6AG7	0Ω	0Ω	0Ω	60Ω	220Ω	† 11KΩ	. 1Ω	† 1. 1KΩ	
V 25	12BH7	† 28KΩ	2. 2KΩ	0Ω	. 1Ω	. 1Ω	† 28KΩ	2. 2KΩ	0Ω	0Ω
V 26	21AXP22	† 11KΩ	† 110KΩ	▲130-270KΩ	† 9KΩ	† 5KΩ	†110-170KΩ	▲130-270KΩ	NC	30Meg
V 27		PIN 10 NC	PIN 11 ▲130-270KΩ	PIN 12 † 130KΩ	PIN 13 † 4KΩ	PIN 14 † 11KΩ				

* MEASURED IN "UHF" POSITION.
† MEASURED FROM POSITIVE SIDE OF C1.
■ MEASURED FROM 130V LINE.
▲ MEASURED FROM PIN 3 OF V16.
NC-NO CONNECTION.
TP-TIE POINT.

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage should be disabled by removing the fuse (M3) in series with pin 3 of the deflection yoke socket. Connect a 1500 ohm/100 watt resistor from pin 7 of deflection yoke socket (B+ line) to high side of vertical centering control (R8A) (B- line).

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A) to chassis.
Connect two matched 100KΩ (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of first video amplifier tube (V7). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓐ. Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator output for -15 volts on VTVM for final peaking A1, A3 and A4.
2.	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A2	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Move VTVM to point Ⓐ and chassis as in step 1. Retouch A4 for maximum deflection and then repeat step 2.
3.	"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A3, A4	Adjust for maximum deflection. Remove ground from pin 8 of V6A. Remove 2 - 100KΩ resistors from point Ⓐ and chassis.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.
Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 2 (grid) of first video amplifier (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓐ. Low side to chassis.	A1, A3, A4	Disconnect stabilizing capacitor (C5). Adjust for curve of maximum amplitude and symmetry similar to Fig. 1.
2.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A2	Reconnect stabilizing capacitor (C5). Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 2. SLIGHTLY retouch A1 for maximum amplitude and straightness of crossover lines. Remove ground from pin 8 of V6A. Continue alignment with step 4.

VIDEO TRAP ALIGNMENT

Connect the negative lead of a 7 volt bias supply to point Ⓓ. Connect the positive lead to chassis.
Ground pin 8 (grid) of 3rd Video IF Amp. Tube (V6A) to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to pin 2 (grid) of first video amplifier tube (V7). Low side to chassis.	Not used	4.5MC (400% Mod)	Any	Vert. Amp. thru detector (Detector lead) of Fig. 3) to pin 1 (plate) of band-pass amplifier tube (V20A). Low side to chassis.	A5	Use high signal generator output. Adjust for MINIMUM 400% indication on scope. Remove ground from pin 8 of V6A.

VIDEO IF ALIGNMENT

Connect the negative lead of a variable bias supply to the ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76. Connect a second bias supply (steps 13 and 14), negative lead to point Ⓖ. Positive lead to tuner chassis. Adjust for -3 volts bias at point Ⓖ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.0015MFD Ceramic Capacitor	High side to point Ⓔ. Low side to chassis.	Not used	45.0MC	Any non-interfering channel	USE VTVM. DC probe to point Ⓓ. Common to chassis.	A6	Adjust for maximum deflection. Attenuate signal generator output to maintain not more than -8 volts on VTVM. Maintain -6 volts bias at ungrounded side of C76.
6.	"	"	"	42.0MC	"	"	A7	"
7.	"	"	"	43.9MC	"	"	A8	"
8.	"	"	"	39.75MC	"	"	A9	Adjust for MINIMUM deflection. Increase signal generator output to produce 3 volts on VTVM at final MINIMUM adjustments.
9.	"	"	"	41.25MC	"	"	A10, A11	"
10.	"	"	"	47.25MC	"	"	A12	"
11.	"	High side to point Ⓔ. Low side to tuner chassis. (Use very short shielded leads).	44MC (10MC Swp)	42.17MC 42.75MC 45.75MC	4	Vert. Amp. thru detector (detector lead of Fig. 3) to pin 1 (plate) of first video IF amp. tube (V4A). Low side to chassis.	A13, A14, A15	Connect the load leads of IF test block (Fig. 3) to pin 1 (plate) of V5A (6AZ8) and pin 6 (plate) V6A (6AN8). If a separate signal generator is used for markers couple it loosely to pin 6 (grid) of first video IF amplifier tube (V4A). Preset A13 trimmer to MINIMUM capacity. Adjust A14 and A15 for maximum gain with 45.75MC marker at 70% of maximum response as in Fig. 4. Adjust A13 to place 42.17MC marker a 50% of maximum response with 42.75MC marker on low frequency side of peak as in Fig. 4. If necessary, SLIGHTLY retouch A14 and A15. Remove IF test block.
12.	"	"	"	42.17MC 42.75MC 45.0MC 45.75MC	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A6, A7, A8	Adjust sweep generator for 8 volts peak to peak on scope. If a separate signal generator is used for marker couple it loosely to pin 6 (grid) of first video IF amplifier tube (V4A). Check for response curve similar to Fig. 5. If necessary, retouch A6, A7 and A8 for desired response. Exercise care to obtain response curve as in Fig. 5.

ALIGNMENT INSTRUCTIONS (cont)

VIDEO IF ALIGNMENT (Cont).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13.	1000Ω Carbon Resistor in series with .0015MFD ceramic capacitor	High side to front terminal of 1N82 crystal holder. Low side to chassis (Use very short leads).	650MC (50MC Swp)	42.17MC 45.75MC 45.0MC 45.75MC	Between channels 62 and 64	Vert. Amp. thru detector (detector lead of Fig.5) to junction of 180Ω resistor and .0015 MFD. (See remarks) Low side to chassis.	A16, A17, A18	Set tuner to UHF position. Connect a 180Ω resistor in series with a .0015MFD ceramic capacitor between point Ⓥ and chassis. Capacitor end connect to point Ⓥ. Connect a second bias supply to point Ⓣ. Positive lead to chassis. Adjust for -9 volts bias at point Ⓣ. Couple marker generator loosely to detector (Fig.5). Attenuate sweep generator for .5 volts peak to peak on scope. Adjust A18 for maximum gain with 45.75MC and 42.5MC markers as in Fig. 8. Adjust A17 to place 45.75MC marker at peak of curve. Adjust A16 for MINIMUM tilt of curve. (Fig.6). If necessary, to obtain proper bandwidth, adjust L56 (IF trap coil). L55 is adjusted by expanding or compressing coil turns. Remove 180Ω resistor and .0015 MFD capacitor from point Ⓥ and chassis.
14.	Two 130Ω Carbon Resistors	Across antenna (VHF) terminals with 130Ω in each lead.	44MC (10MC Swp)	"	Check all VHF channels	Vert. Amp. to point Ⓥ. Low side to chassis.	A6, A7, A8	Couple marker generator loosely to first video IF amplifier grid. Check for response curve similar to Fig. 6 on all VHF channels. SLIGHTLY retouch A6, A7 and A8 if necessary to correct for any overall tilt as in step 12.
15.	Remove VHF sweep generator and connect UHF sweep generator to antenna terminals. Check all UHF channels for response similar to Fig. 5. SLIGHTLY retouch A16, A17 and A18 to correct any overall tilt. Disconnect generator and bias supplies.							

ANTENNA MATCHING UNIT ALIGNMENT

The antenna unit has been properly aligned at the factory. The RF unit is aligned with a particular antenna matching unit in place. If a new antenna unit is installed, the RF unit should be realigned.
The FM trap (A35) may be aligned without adversely affecting the unit.
Disconnect the lead from L15 (point Ⓧ) to the channel selector switch. Use a short jumper to connect output of matching unit at point Ⓧ through a .001MFD capacitor to pin 6 (grid) of second video IF amplifier tube (V5A). Remove the first video IF amplifier tube (V4) from its socket. The matching unit cover must be in place during alignment.
Connect the negative lead of a variable bias supply to the ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76.
Adjustment A19 thru A22 are adjusted by expanding or compressing coil turns.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
16.	Direct	Across antenna terminals. Low side to chassis.	Not used	45.75MC (400%Mod)	Any	Vert. Amp. to point Ⓥ. Low side to chassis.	A19	Adjust for MINIMUM 400~ indication on scope.
17.	"	"	"	41.25MC	"	"	A20	"
18.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	53MC (10MC Swp)	50MC 53~C 53MC 60MC	"	Vert. Amp. thru detector (detector lead of Fig.3) to point Ⓥ. Low side to chassis.	A21, A23	Remove .001MFD capacitor from point Ⓥ to grid of V5A. Connect a 300Ω, 1 watt carbon resistor from point Ⓥ to chassis. Use very short lead. Set sweep generator for maximum output. Adjust A21 and A22 for response curve similar to Fig. 7. Repeat steps 16, 17 and 18 until no further improvement is noted. A21 affects shoulder of curve (52MC point). Adjust A23 for maximum response at 53MC point. If distortion of response is affected by a second harmonic of sweep generator output, tune a (FM trap) for maximum inductance while adjusting A19 thru A23. After final adjustments return A55 to its original position. Restore connection from L15 to channel switch. Replace V4 in its socket.

VHF TUNER ALIGNMENT

A tuner unit which is operative and requires only minor touch-up adjustments will require no presetting of adjustments. When complete alignment is necessary make the following adjustments:
Preset A23 all the way out. Set channels 7 to 13 oscillator slugs one turn from tight.
Disconnect the link from terminals of L58 (converter plate transformer) and shunt the terminals with a 39 ohm carbon resistor.
Connect a 56 ohm carbon resistor from point Ⓧ to chassis.
Tuner alignment as outlined below requires the use of a heterodyne frequency meter.
Short tuner AGC to chassis and point Ⓧ.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
19.		RF input heterodyne frequency meter to end of insulated wire in hole provided for adjustment of A25. Exercise care that the wire does not touch any tuned circuit causing oscillator drift.	Not used	Set freq. meter to 227MC	8	Not used	A24, A25, A26	Preset A24 to read -3.5 volts at point Ⓥ. The limits of oscillator injection voltage are 2.5 volts minimum and 5.5 volts maximum. Set fine tuning control maximum clockwise. Adjust A25 for audible beat on frequency meter. Adjust A25 clockwise until beat note just begins to change, then turn one full turn in same clockwise direction. Return fine tuning control to its mechanical center of its range.
20.	NOTE: If channel 8 oscillator frequency cannot be reached by adjustment of A25, switch to channel 13 and adjust A27 for channel 13 oscillator frequency. Switch back to channel 8 and adjust A23 for channel 8 oscillator frequency. Switch to channel 13 and readjust A27 for channel 13 oscillator frequency. Repeat until proper frequencies are obtained and no changes are noted.							
21.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (10MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓥ. Low side to chassis.	A26, A39, A40	Couple signal generator loosely to antenna terminals to provide markers. Adjust scope gain for maximum and attenuate generator output for minimum signal input. That will produce usable pattern on scope. Adjust for response similar to Fig. 8. A39 affects frequency of bandpass, A40 affects tilt. Adjust A26 to place markers at 100% on response curve. A26 also affects bandwidth.
22.	Connect the DC probe of VTVM to point Ⓥ. Common to chassis. Adjust A34 for -3.5 volts at point Ⓥ. Repeat steps 19, 20 and 21 until proper response is obtained.							
23.	Two 300Ω Carbon Resistors	Across antenna terminals with 300Ω in each lead.	213MC (30MC swp)	211.25MC 215.75MC	13	Vert. Amp. to point Ⓥ. Low side to chassis.	A41, A43	Adjust for response curve similar to Fig.9. Turn off generator and check oscillator injection at point Ⓥ using VTVM as in step 22. If necessary to adjust A34, turn sweep generator and signal generator back on and recheck channel 13 response. If necessary retouch A41 and A43 for desired response.

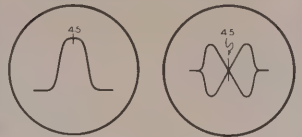


FIG. 1 FIG. 2

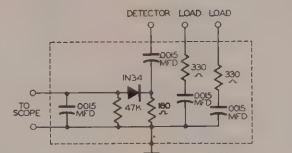


FIG. 3

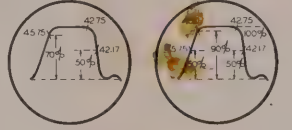


FIG. 4 FIG. 5

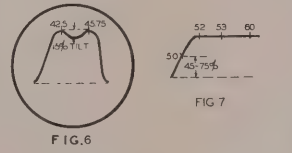


FIG. 6 FIG. 7

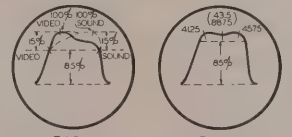


FIG. 8 FIG. 9

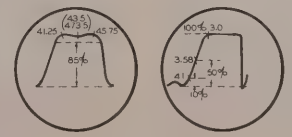


FIG. 10 FIG. 11

VHF TUNER ALIGNMENT (Cont).

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
24.	Two 300Ω carbon resistors	Across antenna terminals with 300Ω in each lead.	183MC (30MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓥ. Low side to chassis.	A36, A39 A40	If necessary retouch A36, A39 and A40 to obtain desired response (Fig. 6). If A40 required adjustment turn off generators and switch back to channel 13 and check injection voltage A5 in step 23. Repeat steps 23 and 24 until proper response is obtained.
25.	"	"	213MC (30MC Swp)	211.25MC 215.75MC	13	"		Check for response curve similar to Fig. 8. Check oscillator injection voltage for each channel at point Ⓥ. If markers fall below 85% of maximum on any one channel retouch A36 and A39 thru A42 to obtain response curves within proper limits as in Fig. 8.
			207MC (30MC Swp)	205.25MC 209.75MC	12			
			201MC (30MC Swp)	199.25MC 203.75MC	11			
			195MC (30MC Swp)	193.25MC 197.75MC	10			
			189MC (30MC Swp)	187.25MC 191.75MC	9			
			177MC (30MC Swp)	175.25MC 179.75MC	7			
26.		Connect frequency meter as in step 19.	Not used	Freq. meter to 189MC	8	Not used	A34	Set fine tuning control to its mid-range position. Adjust A34 for an audible beat on frequency meter.
27.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	85MC (30MC Swp)	83.25MC 87.75MC	"	Vert. Amp. to point Ⓥ. Low side to chassis.	A43, A44	Adjust for response curve similar to Fig. 8. Check oscillator injection voltage as in step 22. Readjust A34 if necessary.
28.	If A34 required readjustment switch receiver and generator to channel 8. Readjust A40 for response similar to Fig. 8. Recheck A33 and A35 for proper oscillator frequency as in step 19.							
29.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	89MC (30MC Swp)	83.25MC 87.75MC	6	Vert. Amp. to point Ⓥ. Low side to chassis.		Check for response curve similar to Fig. 8. Check oscillator injection voltage on each channel at point Ⓥ. If markers fall below 85% on any one channel SLIGHTLY retouch A43 and A44. If unable to obtain correct MINIMUM tilt on channels 5 thru 2 knife coils (by expanding or compressing coil turns) L59 thru L63 and L47 thru L50.
			77MC (30MC Swp)	75.25MC 79.75MC	5			
			69MC (30MC Swp)	67.25MC 71.75MC	4			
			63MC (30MC Swp)	61.25MC 65.75MC	3			
			57MC (30MC Swp)	55.25MC 59.75MC	2			
30.		Connect frequency meter as in step 19.	Not used	Freq. meter to 257MC	13	Not used	A37	Adjust individual channel oscillator slug for audible beat on each channel. Recheck oscillator injection voltage on each channel at point Ⓥ to verify that the voltage is within (2 volts MINIMUM and 5.5 volts maximum) limits.
				251MC	12		A38	
				245MC	11		A29	
				239MC	10		A30	
				233MC	9		A31	
				227MC	8		A32	
				221MC	7		A33	
				129MC	6		A34	
				123MC	5		A35	
				115MC	4		A36	
				107MC	3		A37	
				101MC	2		A39	
31.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	Not used	213MC (400%Mod.)	13	Vert. Amp. to point Ⓥ. Low side to chassis.	A45	Connect the negative lead of a variable bias supply to ungrounded side of C76. Positive lead to chassis. Adjust for -6 volts at ungrounded side of C76. Remove short from tuner AGC at point Ⓧ. Connect negative lead of a second bias supply to point Ⓣ. Positive lead to chassis. Adjust for -15 volts at point Ⓣ. Set scope for maximum gain. Adjust for MINIMUM 400~ indication on scope.
III.	"	"	"	85MC (400~Mod)	6	"	A46	"
32.	Two 130Ω Carbon Resistors	Across antenna terminals with 130Ω in each lead.	183MC (30MC Swp)	181.25MC 185.75MC	8	Vert. Amp. to point Ⓥ. Low side to chassis.	A47	Reduce bias to -3 volts at point Ⓣ. Adjust A47 for maximum amplitude between two peaks on response curve.
34.	"	"	213MC (30MC Swp)	211.25MC 215.75MC	13	"	A48	Adjust A48 for maximum amplitude between two peaks on response curve. A48 is adjusted by expanding or compressing coil turns. Repeat steps 33 and 34. Increase bias at point Ⓣ to -18 volts. Repeat steps 31 and 32. Then reduce bias at point Ⓣ to -3 volts and again repeat steps 33 and 34.
35.	"	"	85MC (30MC Swp)	83.25MC 87.75MC	6	"	A49	Adjust A49 for maximum amplitude between two peaks on response curve.
36.	Switch tuner thru all VHF channels and observe the response on scope, as in steps 25 and 29. The dip at mid-point between two peaks on response curve should be 85% of maximum. If dip exceeds this limit it will be necessary to knife coils L33 thru L36 and L47 thru L50 to correct dip. Always knife coils starting with the highest frequency (channel 13 thru 2) and continuing to the lowest. Remove all test equipment and bias supplies.							

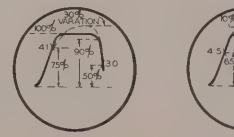


FIG. 12

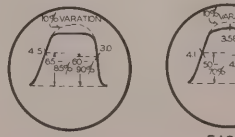


FIG. 13

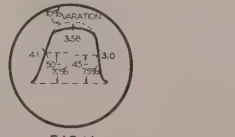


FIG. 14

RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

ALIGNMENT INSTRUCTIONS (cont)

UHF TUNER ALIGNMENT

Turn the change over switch to UHF position. To make the RF adjustment of the UHF tuner, the UHF tuner unit will have to be removed from the set. IF and oscillator adjustments may be aligned without removing UHF tuner. Connect a 100Ω carbon resistor from the center conductor of IF cable to chassis (point ⟨J⟩ on schematic). If the oscilloscope does not have a sensitivity of 5 millivolts per inch, a suitable preamplifier may be used.

Fabricate a test dial with markers scribed on its circumference at 0, 5 and 164 degrees. The test dial should be made to fit over the split gear on the tuner shaft for accurate alignment. Locate the "0" degree reference point with the capacitor plates fully meshed. The stop pin on the tuner should be against the stop plate on the gear assembly when the plates are fully meshed. Connect the high side of a VHF marker generator thru a 1000Ω carbon resistor to point ⟨J⟩. Insert resistor lead (insulate lead) through aperture provided for crystal removal. Connect low side to chassis.

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
37	Two 300Ω Carbon Resistors	Across UHF antenna terminals with 300Ω in each lead.	887.5MC (Use max. sweep width)	41.25MC 43.5MC 45.75MC 887.5MC	83 (164degrees on tuning dial)	Vert. Amp. (thru preamp. if needed) to point ⟨J⟩ thru detector (detector lead of Fig. 3). Low side to UHF tuner chassis.	A50, A51, A52	Use low VHF and UHF marker generator output. If UHF sweep generator has no built-in marker, couple separate marker generator loosely to antenna terminals to provide UHF marker (887.5MC). Adjust A50 and A51 for maximum amplitude over-coupled response curve centered at 887.5MC similar to Fig. 9. Adjust A52 until the 43.5 MC marker coincides with the 887.5MC marker. The 41.25MC and 45.75MC markers should be symmetrically located on top of response curve as in Fig. 9.
38	"	"	473.5MC (Use max. sweep width)	41.25MC 43.5MC 45.75MC 473.5MC	14 (5 degrees on tuning dial)	"	A53, A54	Leave marker generators connected as in step 37. Adjust A53 until 43.5MC marker coincides with 473.5MC marker as in Fig.10. If A53 has insufficient range adjust A54 by repositioning coil until markers coincides. Repeat steps 37 and 38 until proper responses are obtained.

39. Tune thru the entire UHF range and check tracking. If the 41.25MC and 45.75MC markers fall below 85% on any UHF channel it will be necessary to bend the RF plates to correct mistracking. The plates may be bent by using a knife blade with the shield cover removed. Knife the plates while tuning lower in frequency so that tracking above the point of knifing will not be disturbed. A check of which requires knifing may be made by touching the plates with the knifing tool while noting the effect on the response curve, then knifing the proper section or both sections if required. Connect the DC probe of VTVM to point ⟨J⟩. Common to chassis. Tune thru the entire UHF range, at the same time noting the reading on VTVM. Readings between .03 and .4 volts should be obtained. If voltages outside this limit are obtained, it indicates low B+ voltage, low or high crystal impedance or an oscillator tube outside its allowable limits. This voltage may be varied by repositioning L3 (UHF osc. coupling coil. Connect DC probe of VTVM to point ⟨K⟩. Common to chassis. Readings between .75 and 3.5 volts should be obtained. Readings outside this range will cause crystal currents beyond allowable limits and in such cases the oscillator tube should be replaced. If the oscillator tube is replaced steps 37 and 38 should repeated.
allowable limits and in such cases, the oscillator tube should be replaced. If the oscillator tube is replaced steps 37 and 38 should be repeated.

FM TRAP ALIGNMENT

Tune in a local TV station in which interference is noticed, adjust A55 for minimum interference in the picture.

FIRST VIDEO AMPLIFIER AND BANDPASS AMPLIFIER ALIGNMENT

Remove the G-Y,R-Y demodulation tube (V25) from its socket.
Connect the negative lead of a variable bias supply to pin 6 of AGC clamper tube (6T8/V11A). Connect the positive lead to chassis.
Adjust for -2 volts bias at pin 6 of V11A.
Connect a second bias supply to the ungrounded side of C76. Connect the positive lead to chassis. Adjust for -6 volts at ungrounded side of C76.

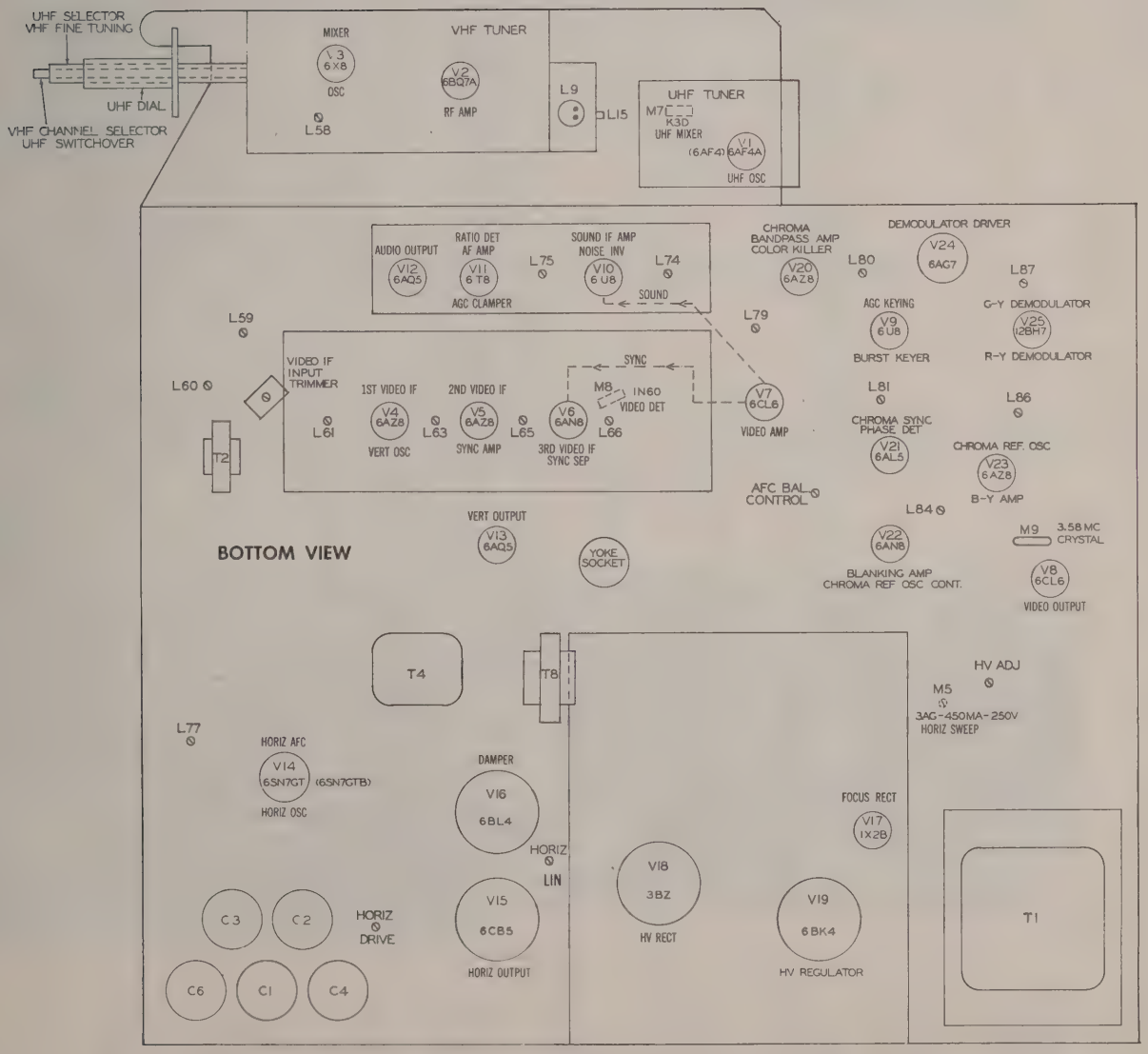
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
40	Direct	Connect signal generator and video sweep modulator across antenna terminals. (See remarks)	3MC (3MC Swp)	3.0MC 3.58MC 4.1MC	4	Vert. Amp. of wide band scope to point ⟨D⟩. thru detector (detector lead of Fig. 3). Low side to chassis.		Signal generator should provide channel 4 video carrier frequency (67.25MC) with crystal accuracy. Connect DC probe of VTVM to pin 2 (grid) of 6CL6 (V7). Common to point ⟨D⟩. With zero video sweep modulation adjust signal generator output (67.25MC) for 1.5 volts on VTVM. Remove VTVM and apply video sweep modulation, being careful not be overload. Couple VHF signal generator loosely to pin 6 (grid) of 1st. video IF amplifier tube (V4) to provide 45.75MC marker. To set the local oscillator exactly on frequency adjust fine tuning control until a beat pattern is obtained on scope. Remove VHF generator from pin 6 of V4A. The response on scope should be similar to Fig. 11. Remove bias supplies.
41	"	"	"	3.0MC 4.1MC	"	Vert. Amp. of wide band scope thru detector (detector lead of Fig. 3). To terminal "B" of L80. Low side to chassis.	A56	Connect a 330Ω, 1 watt resistor across terminals "A" and "B" of bandpass primary coil (L80). Connect negative lead of a bias supply to pin 9 (grid) of burst keyer tube (V9B). Connect negative lead of a second bias supply to junction of R168 and R169. Connect positive terminals of both to chassis. Adjust for -7 volts at both bias points. Adjust A56 for correct response curve similar to Fig. 12. Remove 330Ω resistor from terminals "A" and "B" of L80 and connect to terminals "C" and "F" of demodulator transformer (L87) for adjustments in step 42.
42	Direct	Connect signal generator and video sweep modulator across antenna terminals. (See remarks-step I)	"	"	"	Vert. amp. of wide band scope thru detector (detector lead of Fig. 3) to terminal "F" of L87. Low side to chassis.	A57, A58	Connect both bias supplies as in step 41. At pin 9 of V9B increase bias to -9 volts. At junction of R168 and R169 increase bias to -15 volts. Adjust A57 and A58 for response curve similar to Fig.13. If necessary, make SLIGHT readjustment of A7 for desired response. Remove 330Ω from terminals "C" and "F" of L87.
43	"	"	"	"	"	Vert. Amp. of wide band scope thru 2MMF capacitor and detector (detector lead of Fig. 3) to pin 1 (plate) of R-Y demodulated (V25B). Low side to chassis.	A59	Adjust A59 for response similar to Fig. 14. In step 42, if adjustment of A7 required readjustment for desired response, repeat step 14 for a check of the overall IF response check with response curves similar to Fig. 5. Replace fuse (M3) in its fuse holder. Remove 1500Ω, 10 watt resistor from pin 7 of deflection yoke socket and high side of R8A (B- line).

ALIGNMENT INSTRUCTIONS (cont)

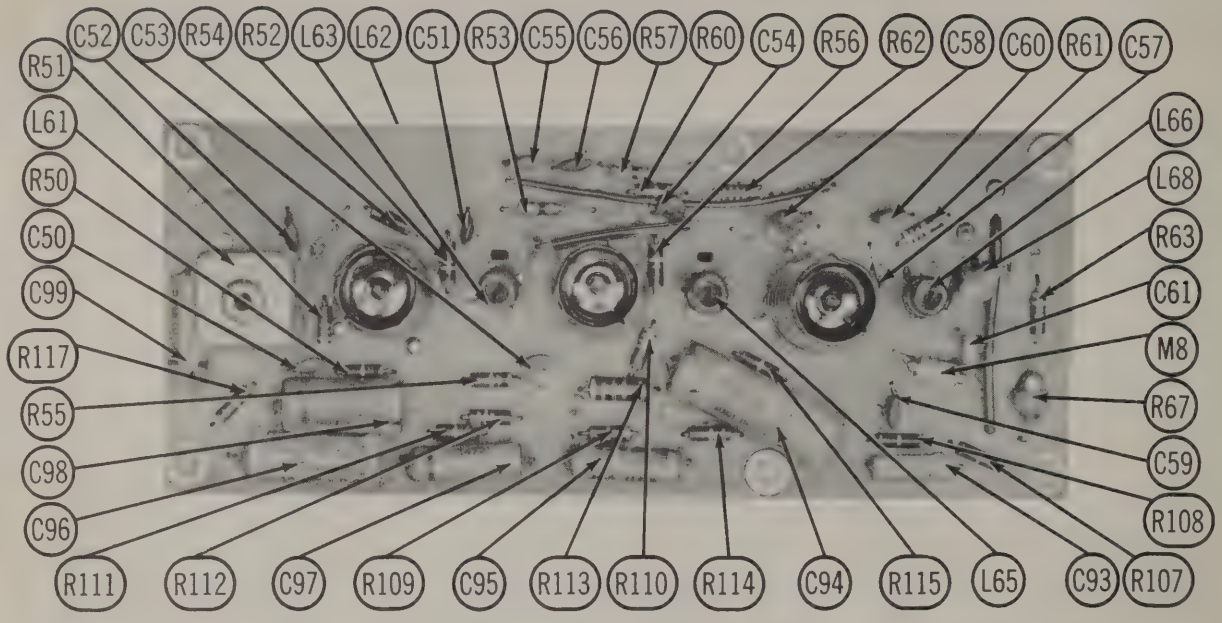
COLOR AFC ALIGNMENT

Connect a 100% saturated color bar generator across the antenna terminals (a TV color signal may be used if available).
Connect the negative lead of a 15 volt bias supply to point D . Connect the positive lead to chassis.
Turn the channel selector to correct channel (whichever crystal that was supplied with the generator) or correct channel for TV color signal. Adjust horizontal hold control of the generator until color is in sync.

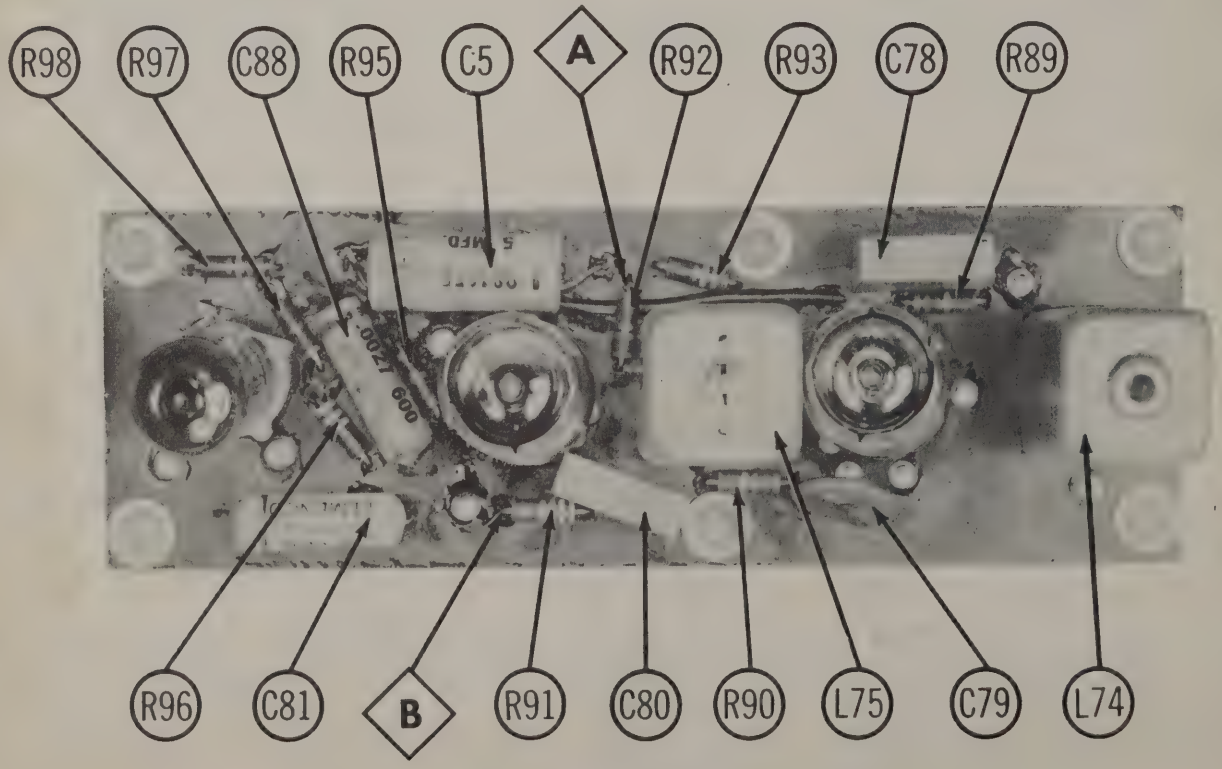
	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
44.	Direct	Use color bar generator. Across antenna terminals.			DC probe to pin 7 (plate) of color phase detector (V21). Common to chassis.	A60, A61, A62	Connect a short jumper from terminal "C" of bandpass primary coil (L80) to chassis. Adjust A60 for maximum deflection on VTVM. Set the hue control to its mid-range position and adjust A61 for maximum deflection. Remove short from terminal "C" of L80 and chassis. Then adjust A62 for maximum deflection.
45.	"	"			Vert. Amp. to pin 2 (red grid) of picture tube. Low side to chassis.	A63	Connect a clip lead from point Ⓜ to chassis. Adjust A63 for zero indication on scope. Remove clip lead from point Ⓜ and chassis.
46.	"	"			DC probe to point Ⓜ. Common to chassis.	R20	Connect a 10 to 15MMF capacitor across 3.58MC crystal (M9). Adjust AFC control (R20) for zero deflection on VTVM. Remove capacitor from across M9 and adjust the color control (R2) for color sync.



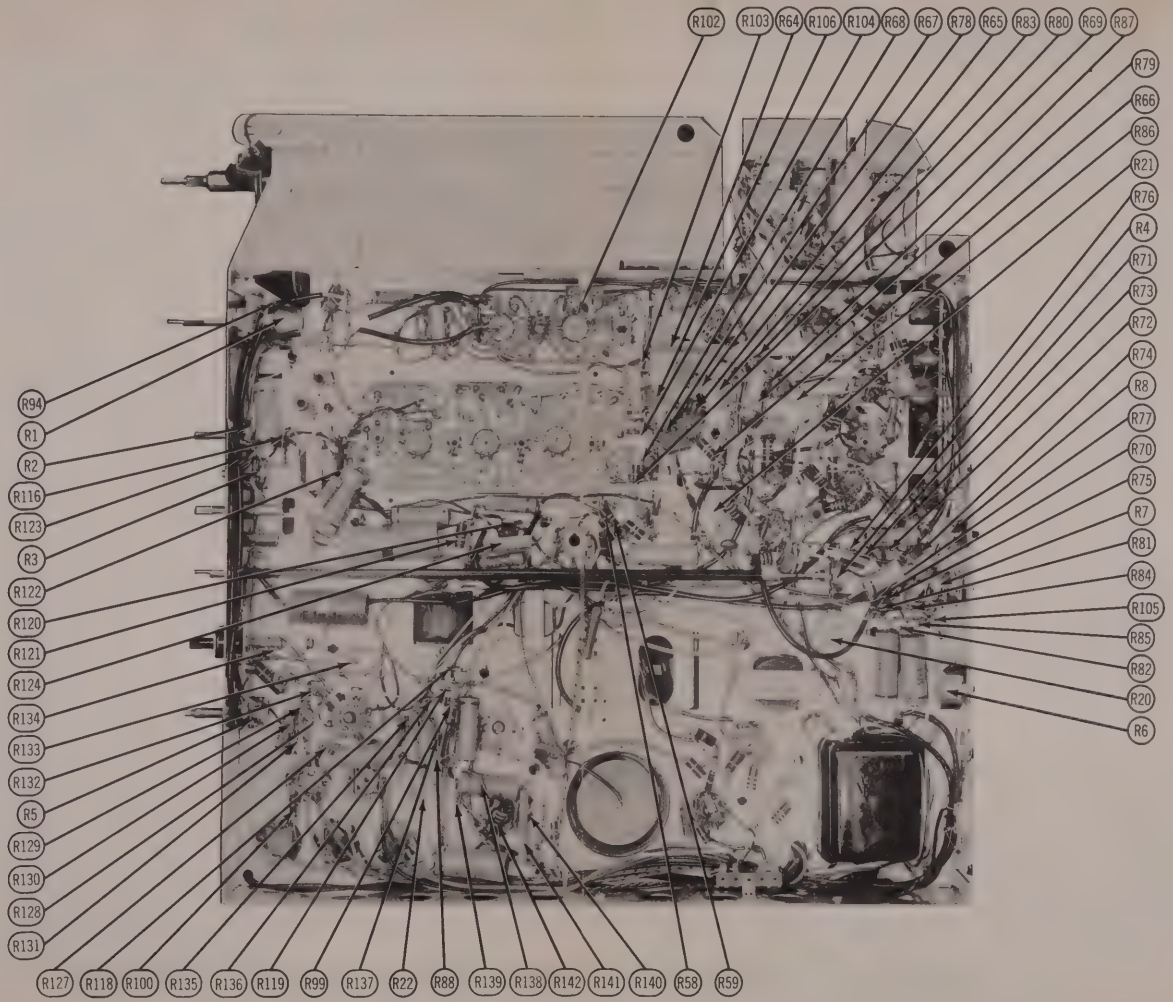
TUBE PLACEMENT CHART



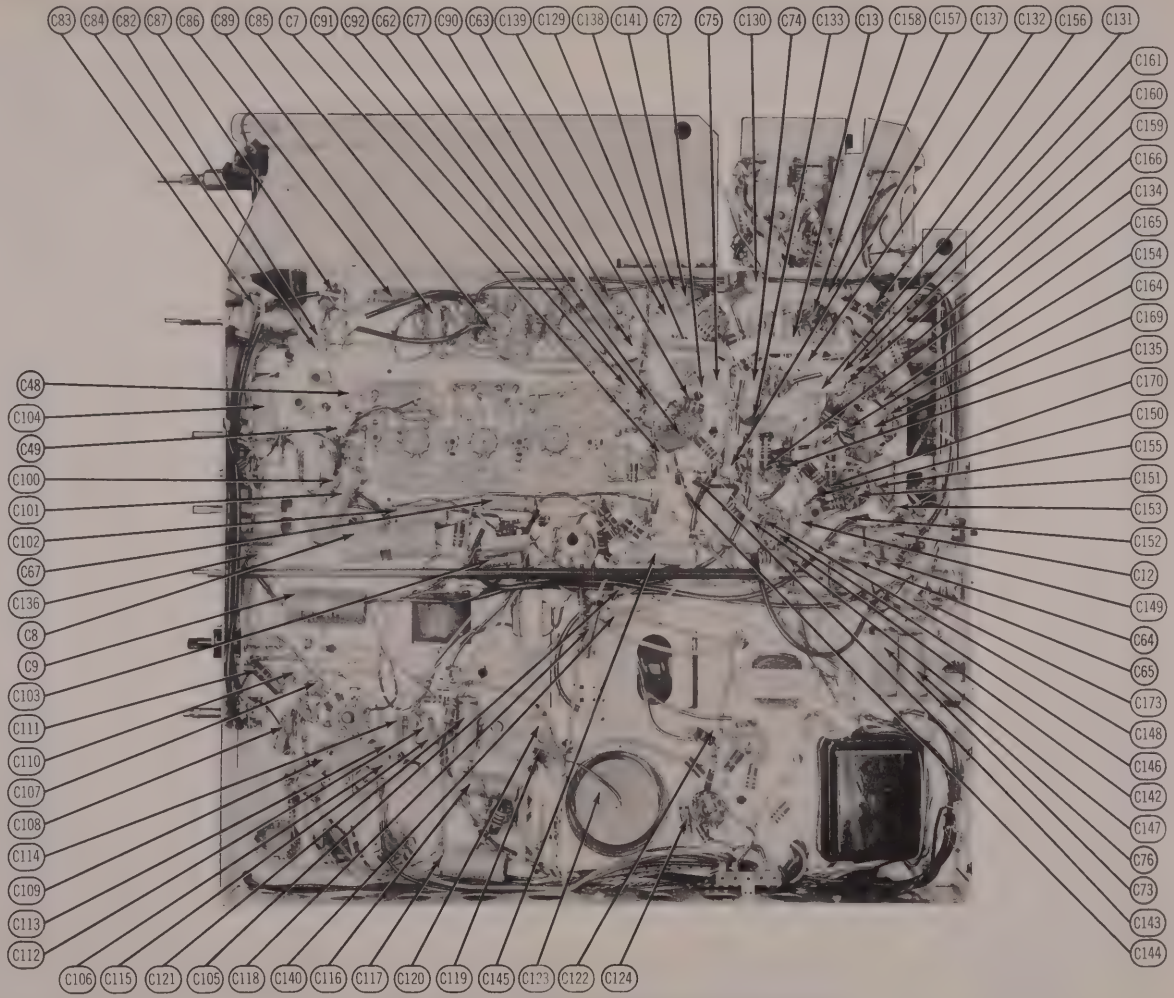
VIDEO IF SUB-CHASSIS PRINTED CIRCUIT



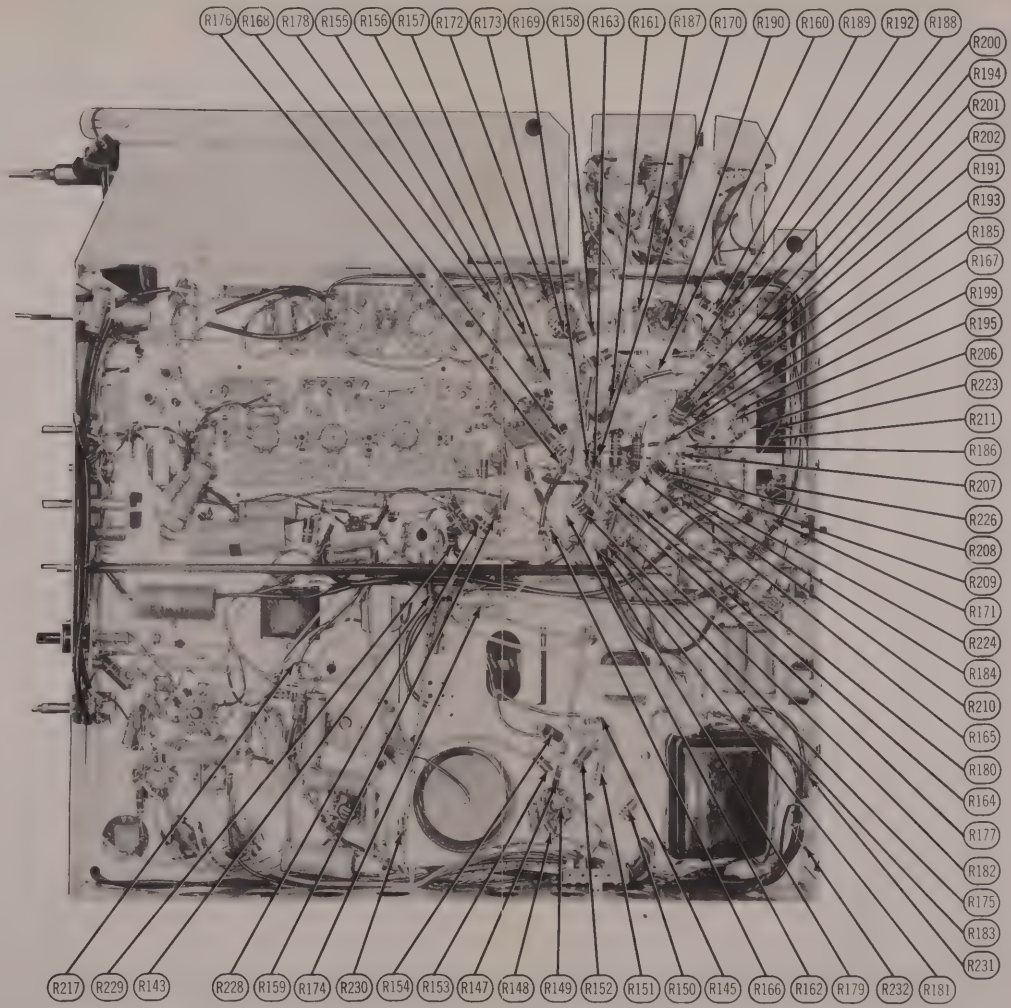
SOUND IF SUB-CHASSIS PRINTED CIRCUIT



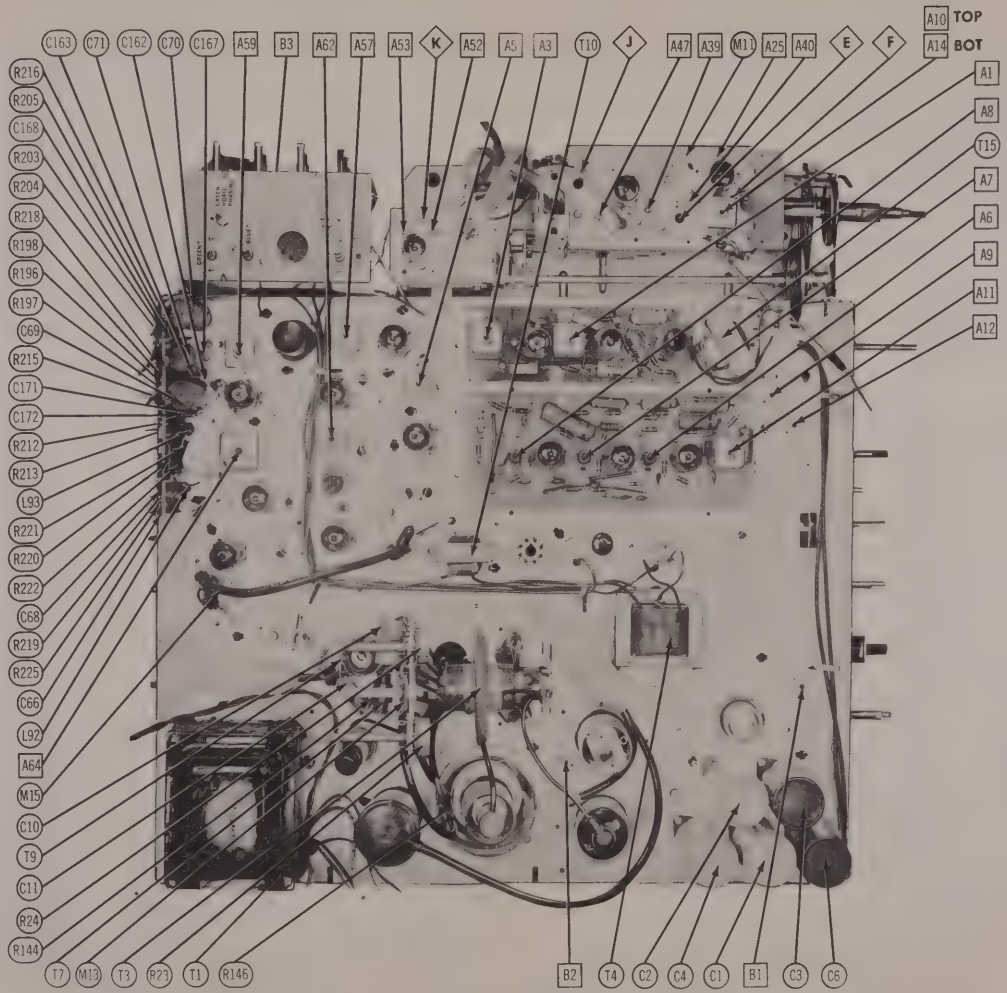
CHASSIS BOTTOM VIEW RESISTOR IDENT. (R1-R142)



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW RESISTOR IDENT. (R143-R232)



CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP.	RATING VOLT	REPLACEMENT DATA: RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C144	4700			BPD-0047	DD-472	K079	SU-0047	DC-125	5HK-D47	
C145	33	200	76905	P33BN-23		CUBSP33		PT4032	2TM-P32	Note 5
C146	2		79993	MPO-SZ2	TC Z-2R2	TZ05	MPOA-2R2		STCCB-V22	
C14*	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C148	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C149	3		100825							
C150	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C151	130		71854	8U30	D6-130	TP3S	GPSK-130	DC-5439	SCA-Q30	
C152	4		100826			TP05				
C153	270	500	73980	BPD-01	MPO-S270	STS-S270	MPO-S25-271	MCM241	MS-327	
C154	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C155	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C156	10000		73960	BPD-01	DD-103	K083	SU-01	DC-511	5HK-S1	
C157	.01	400	73961	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C158	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C159	.0047	400	79017	614700	D6-472	CUBS4T	GP2-333-472	PT624T	6TM-D47	
C160	18		73041		TC N-18	TN04	N750K-180			
C161	39		73564	8139	D6-390	TP3S	GPSK-390	DC-5439	SCA-Q39	
C163	8		78238			TP08				
C163	10000		73960	BPD-01	DD-103	K083	SU-01	DC-511	5HK-S1	
C164	.0047	600	79017	624700	D6-472	CUBD4T	GP3-333-223	PT624T	6TM-D47	
C165	18		73041	8118	D6-180	TP2	GPSK-180	DC-5418	SCA-Q18	
C166	39		73564	8139	D6-390	TP3S	GPSK-390	DC-5439	SCA-Q39	
C167	18		73041		TC N-18	TN04	N750K-180			
C168	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C169	2		100825							
C170	270	500	59463	1469-00027	D6-271	SR5T27	SU-271	MCB241	MS-327	
C171	18		73041		TC N-18	TN04	N750K-180			
C172	10000		73960	BPD-01	DD-103	K082	SU-01	DC-511	5HK-S1	
C173	.0027	600								Note 2

Note 2. Not used in some versions.
Note 3. Model 21CT661U uses .0068MFD in this application (part #73808).
Note 4. Model 21CT661U uses .0068MFD in this application (part #73788).
Note 5. Some versions use 10000MMF in this application (part #73581).

CONTROLS

ITEM No	RATING RESIST OHMS	RATING WATTS	REPLACEMENT DATA: RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2000	½	100393	F7-50			UR383	Brightness - Panel
B	1Meg	½		RS-07				Volume Tapped at 200K -Rear
C	Switch			SA-4				Volume Switch
R2A	2000	½	100382	B-6	A47-2000-S	QU-1I0	U-6	Color
B	Shaft		Not Req.	Not Req.	FS-3	No Req.	Not Req.	Attach to R2A.
R3A	2.5Meg	½	100390	F1-76		* QJ-253	UE1892	Height-Panel
B	1000	½		R2-5				Vert. Linearity - Rear
R4A	3000	½	100381	A-108	A47-2000-S		U-6	Contrast
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R4A.
R5A	1.5Meg	½	100384	F1-84		**QJ-255	UP1551, † UR555, †	Vert. Hold - Panel
B	2.5Meg	½		R1-77				Tone - Rear
R6A	1500	2	100386	VK-130	A43-1500	WK-1500	RU500,	Vert. Centering - Wire Wound
B	Shaft		Not Req.	Not Req.	FS2-4/4	Not Req.	Not Req.	Attach to R6A.
R7A	500	½	100389	F1-60		* QJ-255	UE1482	AGC - Panel
B	2.5Meg	½		R2-78				Noise Inverter - Rear
R8A	500K	½	78908	BX-59	A47-500K-S	B11-133	TA55L	Killer Threshold
B	Shaft		Not Req.	Not Req.	FKS-1	TM-2 Kit	Not Req.	Attach to R8A.
R9A	100	½	100398				UE-39	Green Vert. Tilt- Panel
B	100	½						Green Vert. Amplitude - Rear
R10A	100	½	100388				UE-39	Blue Vert. Tilt-Panel
B	100	½						Blue Vert. Amplitude-Rear
R11A	100	½	100388				UE-39	Red Vert. Tilt-Panel
B	100	½						Red Vert. Amplitude-Rear
R12A	1500	½	100392	AB-6	A47-1500-S	QU-1I0	TA152L	Green Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R12A.
R13A	1500	½	100391	AB-5	A47-1500-S	QU-1I0	TA151L	Blue Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R13A.
R14A	1500	½	100392	AB-6	A47-1500-S	QU-1I0	TA152L	Red Horiz. Amplitude
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R14A.
R15A	500K	½	100391	AB-59	A47-500K-S	QU-133	TA55L	Green Background
B	Shaft		Not Req.	AK-1	KSS-3	Not Req.	Not Req.	Attach to R15A.
R16A	500K	½	100391	AB-59	A47-500K-S	QU-133	TA55L	Blue Background
B	Shaft		Not Req.	AK-1	KSS-3	Not Req.	Not Req.	Attach to R16A.
R17A	500K	½	100391	AB-59	A47-500K-S	QU-133	TA55L	Red Screen
B	Shaft		Not Req.	AK-1	KSS-3	Not Req.	Not Req.	Attach to R17A.
R18A	500K	½	100391	AB-59	A47-500K-S	QU-133	TA55L	Fine Screen
B	Shaft		Not Req.	AK-1	KSS-3	Not Req.	Not Req.	Attach to R18A.
R19A	500K	½	100391	AB-59	A47-500K-S	QU-133	TA55L	Green Screen
B	Shaft		Not Req.	AK-1	KSS-3	Not Req.	Not Req.	Attach to R19A.
R20A	250K	½	100387	AB-50	A47-250K-S	QU-110	TA254L	R. V. Adjustment
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R20A.
R21A	250K	½	100387	AB-50	A47-250K-S	QU-130	TA254L	AFC Balance
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R21A.
R22A	250K	½	100387	AB-50	A47-250K-S	QU-130	TA254L	Horiz. Drive
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R22A.
R23	250	½	100394					Focus
R24	100	½	100395					Horiz. Centering

* Concentrikit Equivalent, K-15 Kit, Base Elements and Shafts; B11-239, P19-018
B47-018, R15-004
**Concentrikit Equivalent, K-8 Kit, Base Elements and Shafts; B11-138, P20-104
B11-239, B11-112
♦ Concentrikit Equivalent; K-15 Kit, Base Elements and Shafts; B11-133, P19-013
B11-239, R15-006
† Universal Replacement (Mallory Exact Duplicate Part No. UR1896).

RESISTORS

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R25	4700	½	502247		
R26	3300	½	502233	BTS-3300	
R27	6800	½	512268		
R28	1000	½	502310	BTS-1000	
R29	10K	½	502310	BTS-10K	
R30	100	½	502110	BTS-100	
R31	120	½	502118	BTS-120	
R32	100K	½	502410	BTS-100K	
R33	100K	½	502410	BTS-100K	
R34	1Meg	½	502510	BTS-1Meg	
R35	1Meg	½	502510	BTS-1Meg	
R36	1000	½	502310	BTS-1000	
R37	100K	½	502410		
R38	10	½		BTS-10	
R39	100K	½	502410		
R40	3300	½	502233	BTS-3300	
R41	1000	½	502310		
R42	12K	1	522315		
R43	10K	1	512310	BTA-10K	
R44	120	1	502118	BTS-120	
R45	6800	2	522368	BTS-6800	
R46	56K	2	503356	BTS-56K	
R47	3900	½	502339	BTS-390K	
R48	470K	½	503447	BTS-470K	
R49	1000	½	512310	BTA-1000	
R50	1000	½	502310	BTS-1000	
R51	47000	5%	503247		
R52	100K	5%	503410		
R53	1000	½	502310	BTS-1000	Note 1
R54	680	5%	500068	BTS-68 5%	

RESISTORS (cont)

ITEM No	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor PART No.	IRC PART No.	NOTES
R55	1000	½	502310	BTS-1000	
R56	100K	5%	503410		
R57	1000	½	502310	BTS-1000	Note 1
R58	10K	2	522310	BTS-10K	Note 3
R59	10K	3	522310	BTT-10K	Note 3
R60	68	5%	503068	BTS-68 5%	
R61	470	½	502147	BTS-470	
R62	1000	5%	503118	BTS-189 5%	
R63	3300	5%	503333	BTS-3300 5%	
R64	5000	10	100443	PW10-5000	
R65	22K	2	522322		
R66	12K	2	522312		
R67	33	½	503053	BTS-33	
R68	1800	½	502218	BTS-1800	
R69	1200	5%	512313	BTS-1200 5%	
R70	100K	½	502410	BTS-100K	
R71	82K	½	502382	BTS-82K	
R72	5600	½	502356	BTS-5600	
R73	18K	½	502318	BTS-18K	
R74	33K	½	502333	BTS-33K	
R75	18K	2	522318	BTS-18K	
R76	100	½	502110	BTS-100	
R77	560	½	502068	BTS-68	Note 2
R78	22K	½	502322	BTS-22K	
R79	27K	½	502327	BTS-27K	
R80	100K	½	512410	BTS-100K	
R81	1Meg	½	502510	BTS-1Meg	
R82	150	5%	502413	BTS-150 5%	
R83	18K	½	502318	BTS-18K	
R84	150K	5%	503415	BTS-150K 5%	
R85	330	½	502133	BTS-330	
R86	47K	½	502347	BTS-47K	
R87	33K	½	502333	BTS-33K	
R88	2200	½	502222	BTS-2200	
R89	180	½	502318	BTS-1800	
R90	120	½	502112	BTS-120	
R91	39K	½	502339	BTS-39K	
R92	150	5%	502115	BTS-150 5%	
R93	27K	5%	503327	BTS-27K 5%	
R94	22K	½	502322	BTS-22K	
R95	10M	½	502510	BTS-10Meg	
R96	330K	½	502433	BTS-330K	
R97	1.5Meg	½	502515	BTS-1.5Meg	Note 3
R98	820	½	502482	BTS-820K	
R99	47	2	522147	BTH-470	
R100	47	½	502047	BTA-47	
R101	3.3Meg	½	502533	BTS-3.3Meg	Note 2
R102	470	½	502447	BTS-470K	
R103	18	½	502318	BTS-18K	
R104	330	½	502133	BTS-330	
R105	270	½	502427	BTS-270K	
R106	270	½	502427	BTS-270K	
R107	1.5Meg	½	502515	BTS-1.5Meg	
R108	1.5Meg	½	502515	BTS-1.5Meg	
R109	1Meg	½	502510	BTS-1Meg	
R110	33	½	505333	BTS-33K	
R111	560	½	502256	BTS-5600	
R112	27	½	502327	BTS-27K	
R113	8200	5%	512322	BTA-8200 5%	
R114	270	½	502327	BTS-2700	
R115	2.2Meg	½	502522	BTS-2.2Meg	Note 4
R116	1Meg	½	502510	BTS-1Meg	
R117	2.2Meg	½	502522	BTS-2.2Meg	
R118	2.7Meg	½	502527	BTS-2.7Meg	
R119	1Meg	½	502510	BTS-1Meg	
R120	2.2Meg	½	502522	BTS-2.2Meg	
R121	56K	2	522356	BTH-56K	
R122	15K	5%	502315	BTS-15K 5%	
R123	270	½	512127	BTA-270	
R124	2500	7	100444	PW7-2500	
R125	1200	5%			
R126	2000	5%			
R127	330K	½	502433	BTS-330K	
R128	820K	½	502482	BTS-820K	
R129	82K	½	512382	BTA-82K	
R130	150K	5%	512415	BTA-150K 5%	
R131	3900	½	502329		
R132	100K	5%	512410	BTA-100K 5%	
R133	3.3Meg	½	502533		
R134	68K	½	502368		
R135	150K	½	502415		
R136	330	½	512330		
R137	150K	½	502415		
R138	330	½	502133	BTS-120	
R139	470K	½	502447		
R140	56	½	503056	BTH-56	
R141	10K	10	70997	1.5MA-10K	
R142	4700	2	522147		
R143	4700	5%	512347		
R144	220	½	512322		

Note 1. Some versions use a 10KΩ ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. Some versions use a 1.5Meg ½W resistor in this application.
Note 4. Some versions use a 1.5Meg ½W resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: RCA Victor PART No.	NOTES
T1	117VAC	170VAC @ .8A CAP.	6.3VAC @ 1.65A	6.3VAC @ 3A SEC. 4 6.3VAC @ 11.8A	100432	

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	79379							
T3	Horiz. Output Trans.	100409							
T4	Vert. Output Trans.	100428							
T5A	Yoke-Horiz. (13MB)	100379							
B	Vert. (10MB)								
T6	Horiz. Lin. Coil (.35-1.1MH C. T.)	100414							
T7	Width Choke (.5MH)	79787A							
T8	Vert. Centering Choke	78900							
T9	Horiz. Centering Choke	100415							
T10	Vert. Convergence Choke	100413							
T11	Green Horiz. Phasing Coil	100429							
T12	Red Horiz. Phasing Coil	100429							
T13	Blue Horiz. Phasing Coil	100429							
T14A	Green Dynamic	100974 ①							
B	Blue Convergence	100975 ②							
C	Red Yoke Assembly								

① Includes capacitor C135; Resistors R125, R126, and 8 contact male connector.
② Exciter coil and pole piece assembly (3 used).
③ Control magnet and knob assembly (3 used).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	NOTES
T15	7.6KΩ	3.5Ω	100037	21003	A-3020	A-3878 ①	26848	S-92	① Drill one new mtg. hole.

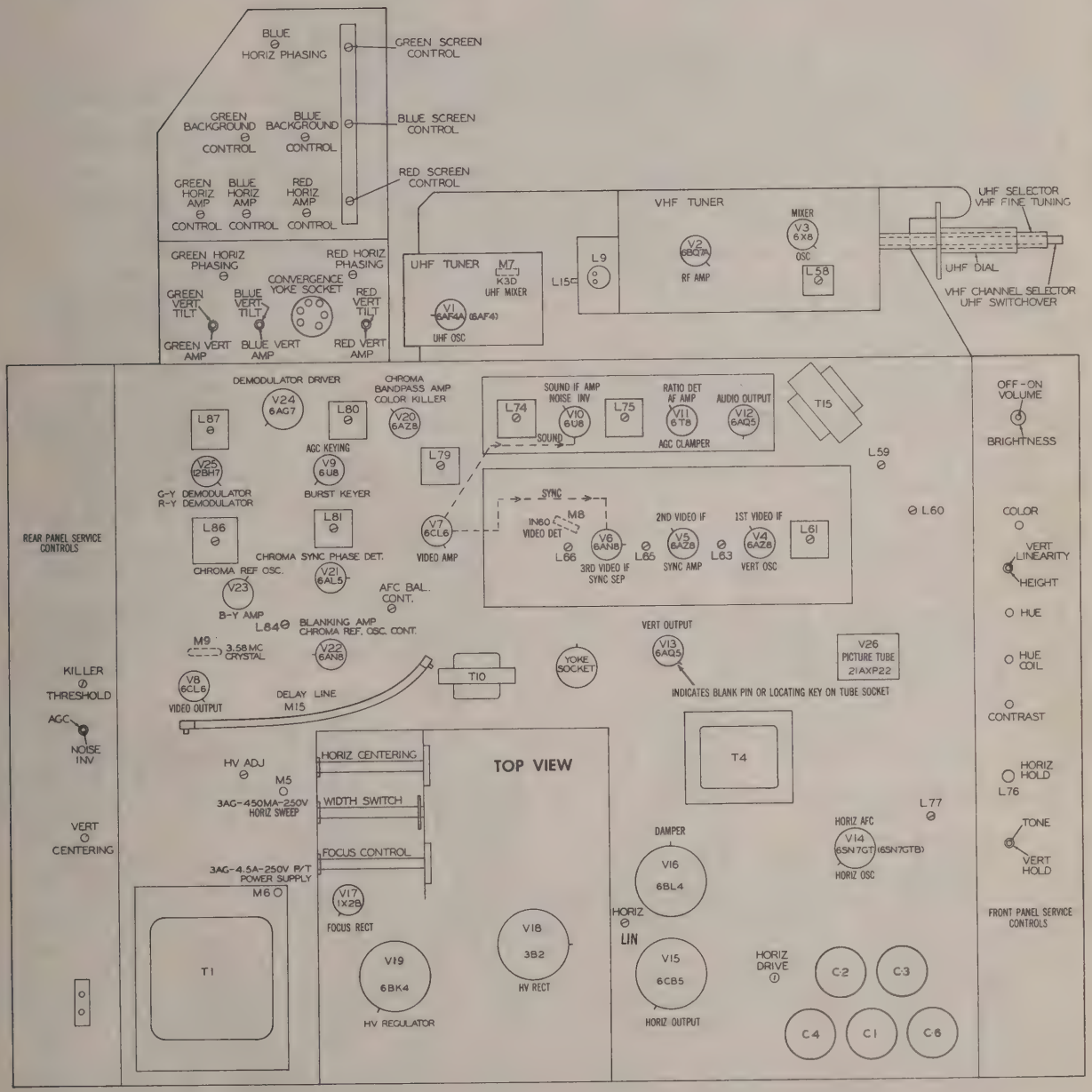
SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: RCA Victor PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	8"	PM	3.4Ω	77873	8A2I	209615	
SP2	8"	PM	3.4Ω	77872	8A2I	209825	

COILS (RF-IF)

ITEM No	RATING PRI.	RATING SEC.	REPLACEMENT DATA: RCA Victor PART No.	MEISSNER PART No	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω		79564			
L2	UHF Mixer Coupling Coil	0Ω					
L3	UHF Osc. Coupling Coil	0Ω					
L4	Fil. Choke	0Ω		79565			
L5	Fil. Choke	0Ω		79565			
L6	Cathode Choke	0Ω					
L7	UHF Osc. Shunt Coil	0Ω		79566			Not used in some versions.
L8	UHF IF Coil	0Ω		79567			.15 Microhenries
L9	VHF Ant. Matching Transf.	.6Ω	.4Ω	100454			Note 1
L10	VHF Ant. Matching Transf.	.8Ω	.4Ω	100454			Note 1
L11	IF Trap	0Ω		100454			Note 1
L12	Ant. Shunt Coil	0Ω		100454			Note 1
L13	Ant. Shunt Coil	0Ω		100454			Note 1
L14	IF Trap	0Ω		100454			Note 1
L15	FM Trap	0Ω		100454			Note 1
L16	RF Choke	0Ω		100697			Note 2
L17	VHF Ant. Coil	0Ω		100693			Channel 2-Note 2
L18	VHF Ant. Coil	0Ω		100689			Channel 3-Note 2
L19	VHF Ant. Coil	0Ω		100692			Channel 4-Note 2
L20	VHF Ant. Coil	0Ω		100691			Channel 5-Note 2
L21	VHF Ant. Coil	0Ω		73461			Channel 6-Note 2
L22	VHF Ant. Coil	0Ω		71469			Channel 8-Note 2
L23	VHF Ant. Coil	0Ω		100690			Channel 10-Note 2
L24	VHF Ant. Coil	0Ω		71469			Channel 11-Note 2
L25	VHF Ant. Coil	0Ω		73553			Channel 11-Note 2
L26	VHF Ant. Coil	0Ω		79727			Channel 12-Note 2
L27	VHF NeuCoil	0Ω		100691			Channel 13-Note 3
L28	VHF NeuCoil	0Ω		100683			Channel 2-Note 3
L29	VHF NeuCoil	0Ω		100694			Channel 3-Note 3
L30	VHF NeuCoil	0Ω		100685			Channel 4-Note 3
L31	VHF NeuL Coil	0Ω		100686			Channel 5-Note 3
L32	VHF NeuL Coil	0Ω		100676			Channel 6-Note 3
L33	VHF NeuL Coil	0Ω		100687			Channel 7-8-Note 3
L34	VHF NeuL Coil	0Ω		100697			Channel 9-10-Note 3
L35	VHF NeuL Coil	0Ω		100687			Channel 11-12-Note 3
L36	RF Choke	0Ω		100679			Note 4
L37	UHF IF Coil	.1Ω	.1Ω	100677			Note 4
L38	UHF IF Coil	0Ω		100678			Note 5
L39	VHF RF Coil	0Ω		79717A			Channel 2-Note 5
L40	VHF RF Coil	0Ω		79727			Channel 3-Note 5
L41	VHF RF Coil	0Ω		79727			Channel 4-Note 5
L42	VHF RF Coil	0Ω		79732			Channel 5-Note 5
L43	VHF RF Coil	0Ω		73460			Channel 6-Note 5
L44	VHF RF Coils	0Ω		100694			Channels 7 thru 13-Note 5
L45	VHF RF Coil	0Ω		100682			Channel 13-Note 5
L46	UHF IF Coil	0Ω		100678			Note 5
L47	VHF Mixer Grid Coil	0Ω		79737			Channel 3-Note 6
L48	VHF Mixer Grid Coil	0Ω		71469			Channel 3-Note 6
L49	VHF Mixer Grid Coil	0Ω		71469			Channel 4-Note 6
L50	VHF Mixer Grid Coil	0Ω		100688			Channel 5-Note 6
L51	VHF Mixer Grid Coil	0Ω		73874			Channel 6-Note 6
L52	VHF Mixer Grid Coil	0Ω		100696			Channels 7 thru 13-Note 6
L53	VHF Mixer Grid Coil	0Ω		100680			Channel 13-Note 6
L54	IF Trap	0Ω					
L55	Fil. Choke	0Ω		79763			

TUBE PLACEMENT CHART



RCA VICTOR MODELS 21-CT-660U, 21-CT-661U, 21-CT-662U, 21-CT-663U, 21-CT-664U (Ch. CTC4, CTC4A)

MISCELLANEOUS ADJUSTMENTS

HORIZONTAL OSCILLATOR ALIGNMENT

Turn the set on and tune in a TV station, preferably a test pattern. If necessary, synchronize the picture with the horizontal hold slug (located on the front control panel). If picture still will not synchronize, adjust the horizontal waveshaping slug (B1) several turns out of the coil and readjust the horizontal hold slug to synchronize the picture. If picture width or linearity is incorrect, adjust the horizontal drive control (R22) and set the width control switch for proper results.

HORIZONTAL WAVEFORM ADJUSTMENT

The horizontal waveform adjustment is adjust at the factory and normally will require no readjustment.
If L76 or L77 coils are replaced in set, scope adjustment will be necessary to synchronize the picture.
Short out the horizontal waveshaping coil (L77) with clip leads and turn the horizontal hold slug all the way out of coil. Rotate horizontal hold slug back in coil until picture locks in sync. Remove short from L77. Connect the low capacity probe of an oscilloscope to point (L) on schematic. Connect low side of scope to chassis. Adjust B1 until the waveform on scope appears similar to Fig. 15. While adjusting B1 keep the picture in sync by readjusting the horizontal hold slug. Remove the oscilloscope from point (L) and chassis. Turn the horizontal hold slug fully clockwise, then counter clockwise until picture synchronizes horizontally, continue two full turns counter clockwise from the pull-in point. Momentarily switch off channel and back again, the picture should remain in sync.

HIGH VOLTAGE ADJUSTMENT

Turn the contrast control and brightness control to their maximum counter clockwise positions.
Connect the probe end of high voltage probe to the cap of the high voltage regulator tube (V19). Common to chassis. Set the meter for a 25KV reading. Adjust the high voltage control (R21) for 25KV on VTVM.
Remove high voltage fuse (M5) from its holder and connect a 0-500MADC milliameter across fuse terminals. Adjust the horizontal linearity slug (B2) for minimum reading on milliameter. Remove milliameter and replace M5 in its holder. Turn the contrast and brightness controls clockwise until picture appears on picture tube. Turn the horizontal drive control (R22) clockwise as far as possible without the presence of white foldover lines in the raster. Recheck the operation of the horizontal hold for proper pull-in action as outlined under "Horizontal Oscillator Alignment".

HIGH VOLTAGE PERFORMANCE CHECK

Connect a 0-1MA DC milliameter in the cathode circuit of the 6BK4 (V19). A reading of .7MA should be obtained when the high voltage is 25KV. Remove milliameter and high voltage probe. Adjust the vertical height and vertical linearity controls so that after final adjustment a vertical overscan of one half inch at top and bottom of viewing area is obtained.

AGC AND NOISE INVERTER CONTROL ADJUSTMENTS

Tune in the strongest signal in that area. Set the noise inverter control (R7B) to its maximum counter clockwise position. Starting with the AGC control (R7A) fully clockwise, adjust R7A counter clockwise until picture on screen shows no sign of pulling.
Tune in weakest TV signal in that area and adjust R7B clockwise until the best signal to noise ratio is obtained, then turn back to the strongest TV signal in that area and check for picture overload. If necessary, slightly retouch R7B. Never adjust AGC control on the weakest signal being received.

MATRIX ALIGNMENT USING 100% SATURATED COLOR BAR GENERATOR

Connect a 100% saturated color bar generator providing IR-Y and IB-Y signals across antenna terminals. Adjust contrast hue and color controls to their mid-range positions. Turn the channel selector switch to the correct channel (channel which crystal has been supplied with color bar generator). Connect the vertical amplifier of scope to red grid of the picture tube (pin 2). Low side to chassis. Observe the +R-Y signal on the scope; if necessary, adjust A62 for zero B-Y signal on scope.
Move the vertical amplifier of scope to the blue grid of the picture tube (pin 12). Observe the +B-Y signal on the scope. Adjust A64 for zero R-Y signal on scope. Move the vertical amplifier back to red grid of the picture tube, recheck for zero B-Y on scope. If necessary, retouch A62. Reconnect scope to the blue grid of the picture tube and recheck for zero R-Y on scope. If necessary, slightly retouch A64 for zero R-Y signal on scope.
Move the high side of scope to green grid of picture tube (pin 6) and check cancellation of red magenta and blue bars. Repeat matrix adjustments until best overall cancellation is obtained.

COMPLETE SET-UP PROCEDURE

Before making any picture tube adjustments, check the "High Voltage Adjustments" under "Horizontal Sweep Circuit Adjustments".

INITIAL ADJUSTMENTS

Tune in a TV station, preferably a test pattern. It should be possible to sync the picture if the horizontal oscillator and AGC systems are operating normally. If the picture will not sync, or if the picture is overloading due to misadjusted AGC control or noise inverter control, it will be necessary to readjust the controls as outlined under "Horizontal Sweep Circuit Adjustments".
Adjust the focus control (R24) for best definition.

CHECK OF HORIZONTAL OSCILLATOR ALIGNMENT

Turn the horizontal hold (located on front control panel) fully counter clockwise. The picture should be out of sync with multiple bars slanting to the right. Slowly turn the horizontal hold clockwise until 1 to 3 diagonal bars are obtained, with slight additional clockwise rotation of the horizontal hold. The picture should fall in sync. The picture should now remain in sync for approximately three additional turns clockwise of the horizontal hold. Turn the horizontal hold fully clockwise; the picture should now be out of sync with multiple bars sloping to the left. Then turn the horizontal hold back counter clockwise until picture locks in sync, then turn two full turns additional counter clockwise. The picture should now lock in sync while switching off channel and back again. If the receiver failed to lock in sync by the above check, refer to "Horizontal Sweep Circuit Adjustments".

CENTERING ADJUSTMENT

Adjust the vertical and horizontal centering controls until the picture is centered within the picture tube mask. If the picture does not cover the marked area, adjust the positioning for equal blank areas at top and bottom and each side of picture.

HORIZONTAL WIDTH AND HORIZONTAL DRIVE ADJUSTMENTS

Adjust the width switch (rear panel of H. V. compartment) for an overscan of approximately 3/4" on each side.
Adjust the horizontal drive control (R22) as outlined under "High Voltage Adjustment".

HEIGHT AND VERTICAL LINEARITY ADJUSTMENTS

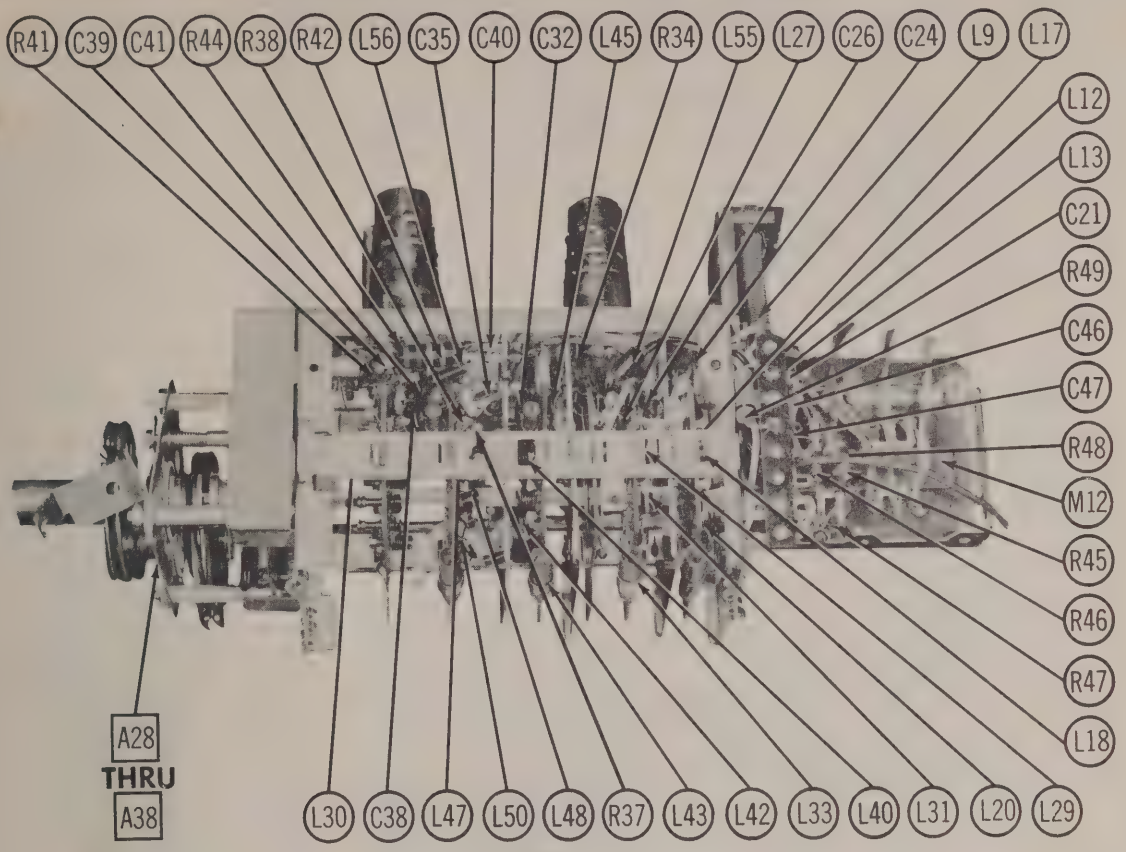
Adjust the height and vertical linearity controls (front panel) for a picture that is symmetrical from top to bottom. Final adjustment should overscan the picture mask by one half inch at top and bottom. Recheck horizontal and vertical centering of the picture. If necessary, readjust the focus control (R24) for best overall picture definition.

PRELIMINARY CONVERGENCE ADJUSTMENT

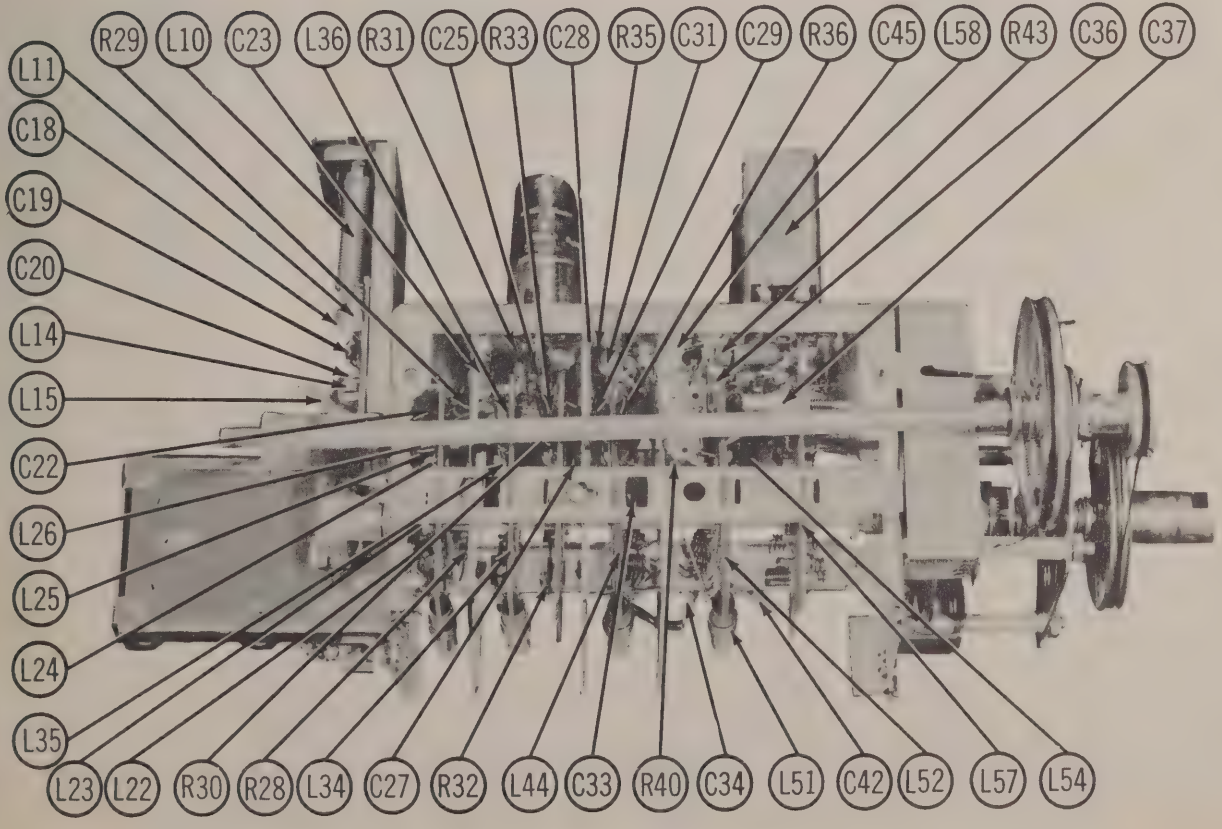
Connect the RF output of a white dot generator across the antenna terminals. Preset the red, green, and blue horizontal and vertical amplitude controls (located inside cabinet, accessible by removing top) maximum counter clockwise. Preset the red, green, and blue vertical tilt controls to their center range position. Turn dot generator on and set channel selector switch to correct channel to receive a dot pattern on picture tube from the dot generator. Adjust the three converging magnets. (small magnets mounted on a knurled nut in a horizontal position). Note which of these three dots require positioning, then adjust magnet corresponding to that color to correct the position of that dot.
In Fig. 16 the dashed lines indicate the direction of dot movement. The solid lines indicate the direction of dot movement when the associated converging magnet is adjusted. Each magnet has a slight effect on the two beams other than the one it is intended to control.
Adjust the three magnets and the blue beam positioning magnet (located over blue gun next to picture tube socket) to produce a white dot near the center of the screen.
Complete convergence should be obtained at the center of the screen indicated by a white dot with no color fringing around its edge.

COLOR PURITY ADJUSTMENTS

Switch channel selector to an unused channel. Turn contrast control maximum counter clockwise. Turn the brightness control maximum clockwise. Set the six magnets on the field equalizing assembly to their maximum counter clockwise positions. Set the red screen control fully clockwise and the blue and green screen controls fully counter clockwise. Loosen the two wing nuts holding yoke assembly so yoke may be moved back and forth. Slide purity magnet assembly toward neck of tube if necessary to provide yoke clearence.
Alternately slide the yoke assembly forward or back and adjust the two purity magnet tabs (or rotate entire assembly) until red purity is obtained with minimum color contamination of the red field. Tighten yoke assembly. Rotate the blue and green screen controls clockwise and adjust all three (red, blue and green) screen controls for a low brightness white raster. If necessary, readjust contrast and brightness controls for proper view of raster. Adjust the six magnets on the field equalizing assembly for the best overall white field over the entire picture tube screen. Adjustment of the magnets will have the most effect near the edges of the screen. Remove the dot generator from antenna terminals and tune in a black and white picture, preferably a test pattern. Adjust the blue and green background controls to their center range positions. Set the brightness control fully clockwise. Set the contrast control fully counter clockwise. Adjust the red, blue, and green screen controls to obtain a high level grey screen. Then turn the contrast control clockwise to observe the picture on the screen. Adjust the brightness control for a dark picture on the screen. Adjust the blue and green background controls for a uniform black and white picture. Adjust the proper screen control, if necessary, to eliminate any color cast. Rotate the brightness control over its brightness viewing range. The picture on the screen should be black and white over the brightness controls viewing range. If necessary repeat adjustments of the background and screen controls until this condition is achieved.



VHF TUNER-RIGHT SIDE



VHF TUNER-LEFT SIDE

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		RCA Victor PART No.	STANDARD REPLACEMENT	
V1	UHF Oscillator	6AF4A	6AF4A	6AF4 used as an alternate
V2	RF Amplifier	6BQ7A	6BQ7A	
V3	Mixer-Oscillator	6X8	6X8	
V4	1st. Video IF Amplifier-Vert. Oscillator	6AZ8	6AZ8	
V5	2nd. Video IF Amplifier-Sync Amplifier	6AZ8	6AZ8	
V6	3rd. Video IF Amplifier-Sync Separator	6AN8	6AN8	
V7	Video Amplifier	6CL6	6CL6	
V8	Video Output	6CL6	6CL6	
V9	AGC Keying-Burst Keyer	6U8	6U8	
V10	Sound IF Amplifier-Noise Inverter	6U8	6U8	
V11	Ratio Detector-AF Amp.-AGC Clamper	6T8	6T8	
V12	Audio Output	6AQ5	6AQ5	
V13	Vert. Output	6AQ5	6AQ5	
V14	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	6SN7GTB is used as an alternate
V15	Horiz. Output	6CB5	6CB5	
V16	Damper	6BL4	6BL4	
V17	Focus Rectifier	1X2B	1X2B	
V18	HV Rectifier	3B2	3B2	
V19	HV Regulator	6BK4	6BK4	
V20	Chroma Bandpass Amp.-Color Killer	6AZ8	6AZ8	
V21	Chroma Sync Phase Detector	6AL5	6AL5	
V22	Blanking Amplifier-Chroma Reference Osc. Control	6AN8	6AN8	
V23	Chroma Reference Osc.-B-Y Amplifier	6AZ8	6AZ8	
V24	Demodulator Driver	6AG7	6AG7	
V25	G-Y Demodulator-R-Y Demodulator	12BH7	12BH7	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	CBS PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	
V26	21AXP22			21AXP22	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	RCA Victor PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	200	250	78957			FP126	TM-200-250	Q-221.5	R2067 †
C2	200	250	78957			FP216	TM-200-250	Q-221.5	R2067 †
C3A	▲80	450	100394	AFH2-64	B048	FP264.5	TM-8040-450	D-255	TVL-3787
B	▲40	200							
C4A	▲40	350	100393		B048	FP250	TM-8040-450	T-110	TVL-2675
B	▲500	25			BRH255	TC2505	TD-500-25	MTH-2550	TVA-1220
C	■80	200							
C5	5	50	74521	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1303
C6	90	350	100375	AFH1-57	A057	FP187	TM-90-500	S-240	TVL-1850
C7	4	350	78919	PRS350V4	BR435	TC60	TD-4-450	FM-4504	TVA-1601
C8	60	300	100376	PRS350V60	BR6045	TC68	TD-60-350	S-180	TVA-1613
C9	1000	3	79625 (Note 1)		BRH620 *	TC415	TD-1000-3NP	MTH-06150 *	
					BRH620			MTH-06150	
C10A	10	25	79786	PRS250V1010	BBRD115	TN-111	TDL-D10-25	FMD-0210	TVA-2210
B	10	25							
C11	5	25	100447	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1203
C12	4	350	78919	PRS350V4	BR435	TC60	TD-4-450	FM-4504	TVA-1601
C13	5	25	100447	SRE50V5	BR550	TC30	TD-5-50	MMT-0505	TVA-1203

Note 1. Non-polarized unit.
* Connect negative leads together.
† Units must be ordered from Mfgr.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C14	1-4		79556		829-4		3115-01-10	CT551		
C15	1000		79559							
C16	1000		79559							
C17	1000		79559							
C18	18				TCZ-18	TZ12	NP0K-180			
C19	5			NP0-DI5	TCZ-4R7	Z011	NP0A-050	ZT-555	5TCCB-V47	
C20	27				TCZ-27	TZ16	NP0L-270			
C21	33			NP0-SI33	TCZ-33	TZ18	NP0L-330	ZT-5433	5TCC-Q33	
C22	270		77838	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C23	1-4		76532		829-4		3115-01-10	CT551		
C24	1000		77084	EF-001	MFT-1000				503C-D1	
C25	220		100672	BPD-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C26	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C27	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C28	220		100672	BPD-00022	DD-221	G051	811-221	UC-5322	5GA-T22	
C29	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C30	470		77293	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C31	.8-3		77151		829-3		3115-01-0R5	CT565A		
C32	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C33	270		77838	SI270	D6-271	TP41	GP2K-271	UC-5327	5GA-T27	
C34	.68		71504		TCZ-R68	TZ02	NP0A-0R68			
C35	1000		77252	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	.1-4		100671		829-4		3115-01-10	CT551		
C37	.8-3		77913		829-3		3115-01-0R5	CT565A		
C38	10		100662	NP0-SI10	TCZ-10	TZ09	NP0A-100	ZT-541	5TCC-Q1	
C39	.8-3		79192		829-3		3115-01-0R5	CT565A		

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	RCA Victor PART No.	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C40	1000		77084	EF-001	MFT-1000				503C-D1	
C41	12		33380		TCN-12	TN02	N750K-120			
C42	.68		71504		TCZ-R68	TZ02	NP0A-0R68			
C43	1000		77084	EF-001	MFT-1000				503C-D1	
C44	82		78603	SI82	D6-820	G040	801-820		5GA-Q82	
C45	1000		77084	EF-001	MFT-1000				503C-D1	
C46	1000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C47	470		77293	BPD-00047	DD-471	K060	831-471	UC-5347	5GA-T47	
C48	22									
C49	22									
C50	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C51	330		79979	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C52	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C53	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C54	330		79979	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C55	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C56	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C57	330		79979	BPD-00033	DD-331	G056	811-331	UC-5333	5GA-T33	
C58	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C59	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C60	1000		78623	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C61	5.6		100374			1R5D33			MS-233	
C62	3300	500	39664	1464-0033		K069	801-001	DC-521	5HK-D1	
C63	1000		77252	BPD-001	DD-102	P288N-1	DF-104	CUB2P1	PT401	2TM-P1
C64	.1	200	73784	1464-0022		1R5D22		MCE460	MS-222	
C65	2200	500	39660	N750-SI120	TCN-120	TN24	N750L-121		5TCU-T12	
C66	120		71614					PT614		
C67	.039	400	73790							
C68	.0012	600	76995	SI1200	D6-122	1W5D12	GP2L-122	UC-5212	1FM-212	
C69	.082	1000	100371							
C70	.082	1000	100371							
C71	.082	1000	100371							
C72	56		71924	N750-SI56	TCN-56	TN16	N750K-560		5TCU-Q56	
C73	.33	200	76994	P288N-33						
C74	.047	200	73558	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C75	.0022	600	73595	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C76	.47	200	73787	P288N-22		CUB2P47		PT4047	2TM-P47	
C77	6.8		205183	NP0-SI6.8	TCZ-6R8		NP0A-6R8	ZT-5568	5TCCB-V68	
C78	2200	500	39660	SI2200	D6-222	1W5D22	GP2-333-222	PT6222	1FM-222	
C79	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C80	1200	500	39654	1464-0012		1R5D12			MS-212	
C81	.0022	600	73595	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C82	.0033	400	79315	SI3300	D6-332	CUB6D33	GP2-333-333	PT6233	6TM-D33	Note 3
C83	.022	400	73562	BPD-02	DD-203	CUB4S22	817-02	PT4122	4TM-S22	
C84	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C85	4700		73473	BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	
C86	.0047	400	73920	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C87	270	500	39638	SI270	D6-271	5W5T27	GP2K-271	UC-5327	1FM-327	
C88	.0027	600	73599	SI2700	D6-272	CUB6D3	GP2-333-272	UC-5227	6TM-D3	Note 4
C89	.0027	1600	73818	P1688N-003	DD30-272	CUB16D3			MB-D3	
C90	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C91	.1	400	73551	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C92	330	500	79191	1469-00033	D6-331	5R5T33	811-331		MS-333	
C93	330	500	39640	1469-00033	D6-331	5R5T33	811-331		MS-333	
C94	.1	600	73551	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C95	.0047	400	73920	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C96	.027	400	73554							
C97	.0047	400	73920	SI4700	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C98	.056	400	100370							
C99	.033	400	100369	BPD-03	DF-503	CUB6S33		PT6133	6TM-S33	
C100	.01	200	79316							
C101	.33	200	76994	P288N-33						
C102	.056	600	79317							
C103	.0039	1600	73780							
C104	.22	200		P288N-22		CUB2P22		PT4022	2TM-P22	Note 2
C105	56		71924	N750-SI56	TCN-56	TN16	N750K-560			
C106	82	1000	76474							
C107	.047	400	73553	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C108	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C109	.47	200	73787	P288N-47		CUB2P47		PT4047	2TM-P47	
C110	270	1000	79022							
C111	.01	600	73594							
C112	12		33380		TCN-12	TN02	N750K-120			
C113	82		71514	SI82	D6-820	G040	801-820		5GA-Q82	
C114	1000	500	39652	1464-001		1R5D1		MCE255	MS-21	
C115	.01	600	73594	BPD-01	D6-103	CUB6S1	GP3-333-103	PT611	6TM-S1	
C116	.22	400	73794	P488N-22		CUB4P22		PT4022	4TM-P22	
C117	.22	600	74957	P688N-22		CUB6P25		PT4022	6TM-P22	
C118	470	1500	77673	HVD-15-470	DD30-471	MCT47	1R5KV-471	DC30347	15GAB-T47	
C119	270	500	76579	1469-00027	DD-271	5R5T27	811-271	MCB241	MS-327	
C120	.15	400	73793							
C121	.1	600	73557	P688N-1	DF-104	CUB6P1		PT601	6TM-P1	
C122	1000	5000	100446		DD60-102					
C123	2500	30000	100398							
C124	.0033	600	73795	SI3300	D6-332	CUB6D33	GP2-333-332	PT6233	6TM-D33	
C125	150									
C126	.0022	600	73595	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C127	.0022	600	73595	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C128	.0022	600	73595	SI2200	D6-222	CUB6D22	GP2-333-222	PT6222	6TM-D22	
C129	82		71514	SI82	D6-820	G040	801-820		5GA-Q82	
C130	.1	400	73551	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	
C131	.022	200	100438							
C132	470	500	76992	1469-00047	D6-471	5R5T47	811-471	MCB245	MS-347	
C133	10000		73960	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C134	.0022	600	73595	1464-0022		1R5D22			MS-222	
C135	.0022	600	73595	1464-0022		1R5D22			MS-222	
C136	470	500	76992	1469-00047	D6-471	5R5T47	811-471	MCB245	MS-347	
C137	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C138	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C139	.01	400	73561	BPD-01	D6-103	CUB4S1	GP3-333-103	PT411	4TM-S1	
C140	.047	200	73558	BPD-05	DF-503	CUB2S47		PT4147	2TM-S47	
C141	1000	500	39652	SI1000	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C142	220	500	39636	1469-00022	D6-221	5R5T22	811-221	MCB240	MS-322	
C143	4700			BPD-0047	DD-472	K079	811-0047	DC-525	5HK-D47	Note 2

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA: RCA Victor Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C144	4700			BPD-0047	DD-472	K047	811-0047	DC-525	5HK-D47	Note 9
C145	.33	500	78805	PSMM-33		CUSBP33		PT4032	2TM-P33	
C146	3		79903	MPO-ZZ3.2	TC Z-3R2	T205	MPGA-2R2	DC-811	5TCCB-V22	
C147	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C148	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C149	2		100925							
C150	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C151	120		71604		61120	D6-121	TP35	GP1K-121	UC-5312	5GA-T12
C152	4		100916							
C153	270	500	39638		MPO-ZZ270	TC2-270	SR57T7	MPO-335-271	MC8541	M8-337
C154	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C155	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C156	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C157	.01	400	73501	BPD-01	D6-103	CUSB401	GP3-333-103	PT4041	4TM-S1	
C158	10000		73501	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C159	.0047	400	79017		SU4700	D6-472	CUSBD47	GP3-333-472	PT8347	5TM-D47
C160	18		39041			TCM-18	TM04	MT50K-180		
C161	39		73604		SU39	D6-390	TP38	GP1K-390	UC-5439	5GA-Q39
C162	8		73216				TP08			
C163	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C164	.0047	400	79017		SU4700	D6-472	CUSBD47	GP3-333-223	PT8347	5TM-D47
C165	15		39041		SU15	D6-150	TP15	GP1K-150	UC-5418	5GA-Q15
C166	39		73604		SU39	D6-390	TP38	GP1K-390	UC-5439	5GA-Q39
C167	18		39041			TCM-18	TM04	MT50K-180		
C168	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C169	2		100925							
C170	370	500	39643		1469-00037	D6-371	SR57T7	811-371	MC8541	M8-337
C171	18		39041			TCM-18	TM04	MT50K-180		
C172	10000		73900	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C173	.0037	600								Note 2

Note 2. Not used in some versions.
Note 3. Model 21CT661U uses .0082MFD in this application (part #73806).
Note 4. Model 21CT661U uses .0082MFD in this application (part #73789).
Note 5. Some versions use 10000MMF in this application (part #73561).

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: RCA Victor Part No	CENTRALAB Part No	CLAROSTAT Part No.	IRC Part No.	MALLORY Part No	INSTALLATION NOTES
R1A	200Ω	½	100383				UR38S	Brightness - Panel
B	1Meg	½		ST-97				Volume Tapped at 200K - Rear
C	Switch			KR-4				Attach to R1B.
R2A	2000Ω	½	100823	B-6	A47-2000-S	QU-10	U-6	Color
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A.
R3A	2.5Meg	½	100390	F1-76		* Q2-853	UR192	Height-Panel
B	1000Ω			S2-5				Vert. Linearity - Rear
R4A	2000Ω	½	100921	A-102	A47-2000-S		U-6	Contrast
B	Shaft		Not Req.	Not Req.	FS-3		Not Req.	Attach to R4A.
R5A	1.5Meg	½	100382	F1-84		**Q2-856	UF156L	† Vert. Hold - Panel
B	2.5Meg	½		S2-77			UR256L	Tone - Rear
R6A	1500Ω	½	100386	WE-130	A43-1500	WK-1500	RH500L	Vert. Centering -Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A.
R7A	500KΩ	½	100389	F1-60		Q2-852	UA1682	AGC - Panel
B	2.5Meg			S2-78				Noise Inverter - Rear
R8A	500KΩ		78902	BX-56	A47-500K-S	BU-133	TA55L	Killer Threshold
B	Shaft		Not Req.	Not Req.	FS2-3	Not Req.	Not Req.	Attach to R8A.
R9A	100Ω						UE-39	Green Vert. Tilt- Panel
B	100Ω							Green Vert. Amplitude - Rear
R10A	100Ω	½	100388				UE-39	Blue Vert. Tilt-Panel
B	100Ω							Blue Vert. Amplitude-Rear
R11A	100Ω	½	100388				UE-39	Red Vert. Tilt-Panel
B	100Ω							Red Vert. Amplitude-Rear
R12A	1500Ω	½	100923	AB-6	A47-1500-S	QU-109	TA15L	Green Horiz. Amplitude
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R12A.
R13A	1500Ω	½	100325	AB-6	A47-1500-S	QU-109	TA15L	Blue Horiz. Amplitude
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R13A.
R14A	1500Ω	½	100383	AB-6	A47-1500-S	QU-109	TA15L	Red Horiz. Amplitude
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R14A.
R15A	500KΩ	½	100381	AB-50	A47-500K-S	QU-133	TA55L	Green Background
B	Shaft		Not Req.	AK-1		Not Req.	Not Req.	Attach to R15A.
R16A	500KΩ	½	100391	AB-50	A47-500K-S	QU-133	TA55L	Blue Background
B	Shaft		Not Req.	AK-1		Not Req.	Not Req.	Attach to R16A.
R17A	500KΩ	½	100391	AB-50	A47-500K-S	QU-133	TA55L	Red Screen
R1 B	Shaft		Not Req.	AK-1		Not Req.	Not Req.	Attach to R17A.
R18A	500KΩ	½	100391	AB-50	A47-500K-S	QU-133	TA55L	Blue Screen
B	Shaft		Not Req.	AK-1		Not Req.	Not Req.	Attach to R18A.
R19A	500KΩ	½	100391	AB-50	A47-500K-S	QU-133	TA55L	Green Screen
B	Shaft		Not Req.	AK-1		Not Req.	Not Req.	Attach to R19A.
R20A	250KΩ	½	100387	AB-50	A47-250K-S	QU-130	TA25L	H. V. Adjustment
H	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R20A.
R21A	250KΩ	½	100387	AB-50	A47-250K-S	QU-130	TA25L	APC Balance
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R21A.
R22A	250KΩ	½	100387	AB-50	A47-250K-S	QU-130	TA25L	Horiz. Drive
B	Shaft		Not Req.	AK-4		Not Req.	Not Req.	Attach to R22A.
R23	150KΩ	½	100396					Focus
R24	100Ω	½	100395					Horiz. Centering

* Concentrikit Equivalent; K-15 Kit, Base Elements and Shafts; BU-139, P19-016
B17-108, R15-009
**Concentrikit Equivalent; K-6 Kit, Base Elements and Shafts; BU-138, P20-104
BU-139, B17-112
♦ Concentrikit Equivalent; K-15 Kit, Base Elements and Shafts; BU-133, P19-013
BU-139, R15-005
† Universal Replacement (Mallory Exact Duplicate Part No. UE1699).

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor Part No	IRC Part No.	NOTES
R25	47000	½	502347		
R26	3300	½	502333	BTS-3300	
R27	68000	½	512268		
R28	10000	½	502310	BTS-10000	
R29	10KΩ	½	502310	BTS-10K	
R30	100Ω	½	502100	BTS-100	
R31	120Ω	½	502112	BTS-120	
R32	100KΩ	½	502410	BTS-100K	
R33	100KΩ	½	502410	BTS-100K	
R34	1Meg	½	502510	BTS-1Meg	
R35	1Meg	½	502510	BTS-1Meg	
R36	100KΩ	½	502410	BTS-100K	
R37	100KΩ	½	502410		
R38	10Ω	½		BTS-10	
R39	100KΩ	½	502410		
R40	2200Ω	½	502322	BTS-3300	
R41	100KΩ	½	502410		
R42	12KΩ	½	502312		
R43	10KΩ	½	512310	BTA-10K	
R44	120Ω	½	502112	BTS-120	
R45	5600Ω	2	522268	BTS-5600	
R46	56KΩ	2	502356	BTS-56K	
R47	3900Ω	2	502239	BTS-3900	
R48	470KΩ	½	502447	BTS-470K	
R49	1000Ω	½	512310	BTA-1000	
R50	1000Ω	½	502310	BTS-1000	
R51	47000Ω	½	502347		
R52	100KΩ	½	502410		
R53	1000Ω	½	502310	BTS-1000	Note 1
R54	680Ω	½	502068	BTS-68	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor Part No.	IRC Part No.	NOTES
R55	1000Ω	½	502310	BTS-1000	
R56	100K 5%	½	502410		
R57	1000Ω	½	502310	BTS-1000	Note 1
R58	10KΩ	½	502310	BTS-10K	Note 2
R59	10KΩ	2	522310	BTS-10K	Note 2
R60	680 5%	½	502068	BTS-68 5%	
R61	470Ω	½	502147	BTS-470	
R62	1800 5%	½	502318	BTS-180 5%	
R63	33000 5%	2	502333	BTS-3300 5%	
R64	5000Ω	10	100443	PW10-5000	
R65	22KΩ	2	522312		
R66	12KΩ	2	522312		
R67	33Ω	½	502033	BTS-33	
R68	1000Ω	½	502310	BTS-1000	
R69	1200 5%	½	512312	BTS-1200 5%	
R70	100KΩ	½	502410	BTS-100K	
R71	1Meg	½	502510	BTS-1Meg	
R72	5600Ω	½	502356	BTS-5600	
R73	18KΩ	½	502318	BTS-18K	
R74	150KΩ 5%	½	502415	BTS-150K 5%	
R75	33KΩ ½	½	502333	BTS-33K 5%	
R76	47KΩ	½	502347	BTS-47K	
R77	33KΩ	½	502333	BTS-33K	
R78	3300Ω	½	502333	BTS-3300	
R79	1800Ω	½	502318	BTS-1800	
R80	120Ω	½	502112	BTS-120	
R81	330Ω	½	502333	BTS-330K	
R82	150Ω 5%	½	502315	BTS-150 5%	
R83	27KΩ 5%	½	502327	BTS-27K 5 %	
R84	22KΩ	½	502322	BTS-22K	
R85	10Meg	½	502610	BTS-10Meg	
R86	33KΩ	½	502433	BTS-330K	
R87	1.5Meg	½	502615	BTS-1.5Meg	Note 3
R88	220KΩ	½	502422	BTS-220K	
R89	470Ω	½	502147	BTS-470	
R90	47Ω	1	512047	BTA-47	
R91	3.3Meg	½	502533	BTS-3.3Meg	Note 3
R92	470KΩ	½	502447	BTS-470K	
R93	18KΩ	½	502318	BTS-18K	
R94	220KΩ	½	502322	BTS-220K	
R95	270KΩ	½	502427	BTS-270K	
R96	330KΩ	½	502433	BTS-330K	
R97	1.5Meg	½	502615	BTS-1.5Meg	Note 3
R98	1.5Meg	½	502515	BTS-1.5Meg	
R99	1Meg	½	502510	BTS-1Meg	
R100	33KΩ	½	502333	BTS-33K	
R101	5600Ω	½	502356	BTS-5600	
R102	27KΩ	½	502327	BTS-27K	
R103	82000 5%	½	512382	BTA-8200 5%	
R104	2700Ω	½	502327	BTS-2700	
R105	2.2Meg	½	502522	BTS-2.2Meg	Note 4
R106	1Meg	½	502510	BTS-1Meg	
R107	2.2Meg	½	502522	BTS-2.2Meg	
R108	2.7Meg	½	502527	BTS-2.7Meg	
R109	1Meg	½	502510	BTS-1Meg	
R110	2.2Meg	½	502522	BTS-2.2Meg	
R121	56K 5%	½	502356	BTS-56K	
R122	15KΩ 5%	½	502315	BTS-15K 5%	
R123	2700	?	512127	BTA-270	
R124	3500Ω	?	100444	PW7-3500	
R125	12000 5%	½			
R126	1200Ω 5%	½			
R127	33KΩ	½	502433		
R128	820KΩ	½	502462	BTS-820K	
R129	82KΩ	½	512382	BTA-82K	
R130	150KΩ 5%	½	512415	BTA-150K 5%	
R131	3900Ω	½	502239		
R132	10KΩ 5%	½	512310	BTA-10K 5%	
R133	3.3Meg	½	502533		
R134	56KΩ	½	502356		
R135	150KΩ	½	502415		
R136	33KΩ	½	512329		
R137	150KΩ	½	502415		
R138	120Ω	½	502112	BTS-120	
R139	470KΩ	½	502447		
R140	56Ω	1	502056	BTS-56	
R141	11KΩ	10	79987	1 3/4A-11K	
R143	470Ω	½	512147		
R143	47000 5%	½	512347		
R144	220	1	512022		

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA: RCA Victor Part No.	IRC Part No.	NOTES
R145	3.3Ω 5%	½	100938	BW½-3.3 5%	
R146	3.3Ω 5%	½	100938	BW½-3.3 5%	
R147	3.2Meg 5%	½	512523		
R148	1.5Meg 5%	½	512518		
R149	100Meg	½	512710		
R150	470KΩ	3	532447		
R151	470KΩ	2	532447		
R152	10Meg	3	532610		
R153	10Meg	2	532610		
R154	10Meg	2	532610		
R155	10KΩ	3	502310	BTS-10K	
R156	3900Ω	3	502339	BTS-3900	
R157	2200Ω	3	502322	BTS-2200	
R158	10KΩ	3	502310	BTS-10K	
R159	2.2Meg	3	502522	BTS-2.2Meg	
R160	3300Ω	3	502333	BTS-3300	
R161	1000Ω	3	502310	BTS-1000	
R162	10KΩ	3	502310	BTS-10K	Note 2
R163	1Meg 5%	½	502510		
R164	1Meg 5%	½	502510		
R165	3.9Meg	½	502539		
R166	33KΩ	2	502333		
R167	10KΩ	½	502310	BTS-10K	
R168	560KΩ 5%	½	502456	BTS-560K 5%	
R169	2.2Meg 5%	½	502523	BTS-2.2Meg 5%	
R170	3.2Meg 5%	½	502523	BTS-3.2Meg 5%	
R171	18Meg	½	502518	BTS-18Meg	
R172	33KΩ	½	512333	BTA-33K	
R173	33KΩ	2	532333	BTS-33K	
R174	27KΩ	2	532327	BTS-27K	
R175	3900Ω	2	532339	BTS-3900	
R176	12KΩ	2	502112	BTS-120	
R177	560Ω	½	502156	BTS-560	
R178	4700Ω	½	502347	BTS-4700	
R179	5200 5%	½	502185	BTS-520 5%	
R180	2200Ω	½	502222	BTS-2200	
R181	47KΩ	3	532347	BTS-47K	
R182	27KΩ	3	532327	BTS-27K	
R183	470Ω	½	502147	BTS-470	
R184	27KΩ	½	502327	BTS-27K	
R185	1000Ω	½	502310	BTS-1000	
R186	47KΩ	½	512347	BTA-47K	
R187	56Ω	½	502056	BTS-56	
R188	560Ω	½	512156	BTA-560	
R189	10KΩ	½	502310	BTS-10K	
R190	220Ω	½	502122	BTS-220	
R191	2200Ω	½	502322	BTS-2200	
R192	3300Ω	½	502333	BTS-3300	
R193	56KΩ	2	522356	BTS-56K	
R194	56KΩ	2	522356	BTS-56K	
R195	120KΩ 5%	½	502513	BTS-120K 5%	
R196	3300Ω	½	502333	BTS-3300	
R197	150KΩ	½	502415	BTS-150K	
R198	270KΩ 5%	½	502427	BTS-270K	
R199	2200Ω	½	502322	BTS-2200	
R200	1500Ω	½	512315	BTA-1500	
R201	56KΩ	2	522356	BTS-56K	
R202	56KΩ	3	532356	BTS-56K	
R203	3300Ω	½	502233	BTS-3300	
R204	180KΩ	½	502418	BTS-180K	
R205	180KΩ	½	502418	BTS-180K	
R206	56KΩ 5%	½	502356	BTS-56K 5%	
R207	15KΩ 5%	½	502315	BTS-15K 5%	
R208	82KΩ 5%	½	522382	BTS-82K 5%	
R209	82KΩ 5%	3	532382	BTS-82K 5%	
R210	27000 5%	½	502327	BTS-2700 5%	
R211	2200Ω	½	502322	BTS-2200	
R212	1500Ω	3	502433	BTS-330K	
R213	180KΩ	½	502418	BTS-180K	
R214	56KΩ	2	522356	BTS-56K	
R215	100KΩ	2	522410	BTS-100K	
R216	100KΩ	2	522410	BTS-100K	
R217	10KΩ	2	522310	BTS-10K	
R218	100KΩ	2	522410	BTS-100K	
R219	5100	½	512151	BTA-510 5%	
R220	5100	½	502151	BTS-510 5%	
R221	15000	2	522215	BTS-1500 5%	
R222	15000	3	532215	BTS-1500 5%	
R223	4700	½	512147	BTA-470	
R224	180Ω	½	502118	BTS-180	
R225	3300Ω	½	502333	BTS-3300	
R226	180KΩ	½	512418	BTA-180K	
R227	5600	20	100304	3D-5600	
R228	100Ω	2	522100	BTS-100	
R229	100Ω	3	532100	BTS-100	
R230	10KΩ	½	512310	BTA-10K	
R231	56KΩ	½	502356	BTS-56K	
R232	56KΩ	½	502356	BTS-56K	

Note 1. Some versions use a 10KΩ ½W resistor in this application.
Note 2. Not used in some versions.
Note 3. Some versions use a 1.5Meg ½W resistor in this application.
Note 4. Some versions use a 1.5Meg ½W resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: RCA Victor Part No	Halldorson Part No	Merit Part No	Stancor Part No	Thordarson Part No.	Triad Part No.
T1	117VAC @ 3.6A	170VAC @ .040 ADC	6.3VAC @ 1.42A	6.3VAC @ 3A SEC. 4 6.3VAC @ 11.8A	100433					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA: RCA Victor Part No	Halldorson Part No	Merit Part No	RCA TYPE No	Rem. Part No.	Stancor Part No	Thordarson Part No	Triad Part No
T2	Vert. Osc. Trans.	79379	B6702	A-3003		V405	A-8125	26A03	A-97X
T3	Horiz. Output Trans.	100429							
T4	Vert. Output Trans	100428							
T5A	Yoke-Horiz. (12MH)	100711 ①							
B	Vert. (110MH)								
T6	Horiz. Lin. Coil (.25-1.1MH C.T.)	100414							
T7	Width Choke (.5MH)	79787A							
T8	Vert. Centering Choke	78900							
T9	Horiz. Centering Choke	100415							
T10	Vert. Convergence Choke	100413							
T11	Green Horiz. Phasing Coil	100429							
T12	Blue Horiz. Phasing Coil	100429							
T13	Red Horiz. Phasing Coil	100429							
T14A	Green Dynamic	100974 ②							
B	Blue Convergence	100978 ③							
C	Red Yoke Assembly								

① Includes capacitor C136; Resistors R125, R126, and 8 contact male connector.
② Caliber coil and gain piece assembly (3 used).
③ Control magnet and knob assembly (3 used).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA: RCA Victor Part No.	Halldorson Part No.	Merit Part No.	Stancor Part No.	Thordarson Part No.	Triad Part No.	NOTES
T15	7.6KΩ	3.5Ω	100637	S1503	A-3035	A-3878 ①	26B46	S-92	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA: RCA Victor Part No.	QUAM Part No.	RCA TYPE No	NOTES
SP1	8"	PM	3.4Ω	77872	8A2I	20S82	
SP2	8"	PM	3.4Ω	77872	8A2I	20S82	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RCA Victor Part No.	MEISSNER Part No.	MERIT Part No.	MILLER Part No.	NOTES
L1	UHF Ant. Coil	0Ω		78564				
L2	UHF Mixer Coupling Coil	0Ω						
L3	UHF Osc. Coupling Coil	0Ω						
L4	FIL. Choke	0Ω		79565				
L5	FIL. Choke	0Ω		79565				
L6	Cable-Choke	0Ω						
L7	UHF Osc.			79566				Not used in some versions.
L8	UHF IF Coil	0Ω		79567				.15 Microhenries
L9	VHF Ant. Matching Trans.	.6Ω	.4Ω	100454				Note 1
L10	VHF Ant. Matching Trans.	.6Ω	.4Ω	100454				Note 1
LU	IF Trap	0Ω		100454				Note 1
L13	Ant. Shunt Coil	0Ω		100454				Note 1
L13	Ant. Shunt Coil	0Ω		100454				Note 1
L14	IF Trap	0Ω		100454				Note 1
L15	FM Trap	0Ω		100454				Note 1
L16	RF Choke	0Ω		100697				Note 2
L17	VHF Ant. Coil	0Ω		100689				Channel 2-Note 3
L18	VHF Ant. Coil	0Ω		100689				Channel 3-Note 3
L19	VHF Ant. Coil	0Ω		100683				Channel 4-Note 3
L20	VHF Ant. Coil	0Ω		100691				Channel 5-Note 3
L21	VHF Ant. Coil	0Ω		73461				Channel 6-Note 3
L22	VHF Ant. Coil	0Ω		71469				Channel 8-Note 3
L23	VHF Ant. Coil	0Ω		100690				Channel 9-Note 3
L24	VHF Ant. Coil	0Ω		71469				Channel 10-Note 3
L25	VHF Ant. Coil	0Ω		72552				Channel 11 -Note 3
L26	VHF Ant. Coil	0Ω		79727				Channel 12-Note 3
L27	VHF Neut.Coil	0Ω		100681				Channel 13-Note 3
L28	VHF Neut.Coil	0Ω		100683				Channel 2-Note 3
L29	VHF Neut.Coil	0Ω		100684				Channel 3-Note 3
L30	VHF Neut.Coil	0Ω		100685				Channel 4-Note 3
L31	VHF Neut. Coil	0Ω		100686				Channel 5-Note 3
L32	VHF Neut. Coil	0Ω		100678				Channel 6-Note 3
L33	VHF Neut. Coil	0Ω		100687				Channel 7-8-Note 3
L34	VHF Neut. Coil	0Ω		100687				Channel 9-10-Note 3
L35	VHF Neut. Coil	0Ω		100687				Channel 11-12-Note 3
L36	RF Choke	0Ω		100679				Note 4
L37	UHF IF Coil	.1Ω	.1Ω	100677				Note 4
L38	UHF IF Coil	0Ω		100675				Note 5
L39	VHF RF Coil	0Ω		79726				Channel 2-Note 5
L40	VHF RF Coil	0Ω		79727				Channel 3-Note 5
L41	VHF RF Coil	0Ω		79727				Channel 4-Note 5
L42	VHF RF Coil	0Ω		79733				Channel 5-Note 5
L43	VHF RF Coil	0Ω		73480				Channel 6-Note 5
L44	VHF RF Coils	0Ω		100694				Channels 7 thru 13-Note 5
L46	VHF RF Coil	0Ω		100682				Channel 13-Note 5
L46	UHF IF Coil	0Ω		100676				Note 6
L47	VHF Mixer Grid Coil	0Ω		79727				Channel 2-Note 6
L48	VHF Mixer Grid Coil	0Ω		71469				Channel 3-Note 6
L49	VHF Mixer Grid Coil	0Ω		71469				Channel 4-Note 6
L50	VHF Mixer Grid Coil	0Ω		100688				Channel 5-Note 6
L51	VHF Mixer Grid Coil	0Ω		73874				Channel 6-Note 6
L52	VHF Mixer Grid Coil	0Ω		100695				Channels 7 thru 13-Note 6
L53	VHF Mixer Grid Coil	0Ω		100680				Channel 13-Note 6
L54	IF Trap	0Ω						
L55	FIL. Choke	0Ω		76783				

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L56	Fil. Choke	0Ω		76763				
L57	VHF Osc.Coils	0Ω		100693				Note 7
L58	Conv. Plate	.3Ω	.1Ω	100673				Includes 39K resistor & trap
L59	39.75MC Trap	0Ω		100421			6226	
L60	47.25MC Trap	0Ω		100422			6225	
L61	1st Video IF	0Ω	.1Ω	100418	17-5002	TV-127	6232	Includes 41.25MC Trap
L62	Fil. Choke	0Ω						
L63	2nd Video IF	.2Ω	.2Ω	100417				
L64	Fil. Choke	0Ω						
L65	3rd Video IF	.2Ω	.2Ω	100417				
L66	4th Video IF	.2Ω	.3Ω	100419				
L67	Series Peaking Coil	3.4Ω		93486	19-7068		6110	62 Microhenries
L68	Shunt Peaking Coil	6Ω		74214	19-3180	TV-184	6180	180 Microhenries
L69	Series Peaking Coil	.4Ω		100441	19-2864			12 Microhenries
L70	Shunt Peaking Coil	4.7Ω		75253	19-3125		6153	120 Microhenries
L71	Series Peaking Coil	10.5Ω		71526	19-3250	TV-185	6181	250 Microhenries
L72	Series Peaking Coil	9.5Ω		74214	19-3180	TV-184	6180	180 Microhenries
L73	Series Peaking Coil	13Ω		100442	19-3300		6155	300 Microhenries
L74	Sound IF	8.5Ω	7Ω	100425				Includes resistor & cap.
L75	Ratio Det.	10.5Ω	1ΩCT	100420	17-3497	TV-115	6205	Tertiary Winding=.3Ω
L78	RF Choke	.72Ω			19-1001		4604	1.5 Microhenries, IRC Part No. CL-1
L79	Chroma Take-Off Trans.	2.5Ω	2.5Ω	100426				Includes Caps. & 4.5MC Trap
L80	Bandpass Primary Coil	11.5Ω	3.5Ω	100424				
L81	Burst Amp. Trans.	1.5Ω	4.2ΩCT	100431	17-6012			
L82	Series Peaking Coil	2Ω		74930	19-2864 ■			12 Microhenries, Wound on 15KΩ resistor
L83	Hue Coil	.2Ω		100410				
L84	Reactance Plate Coil	10Ω		100411				
L85	Chroma Reference Osc. Coil	.4Ω		100441	19-2864			12 Microhenries
L86	Quadrature Trans.	6.8Ω		100430	17-6014			R-Y Winding=.2Ω
L87	Demodulator Trans.	5Ω	3.6ΩCT	100427				G-Y Winding=.2Ω
L88	Series Peaking Coil	.4Ω		100441	19-2864			12 Microhenries
L89	Series Peaking Coil	53Ω		100448				1.7 Microhenries
L90	Series Peaking Coil	.4Ω		100441	19-2864			12 Microhenries
L91	Series Peaking Coil	23.5Ω		100597			6148	750 Microhenries
L92	Series Peaking Coil	3.4Ω		93486	19-7068		6110	62 Microhenries
L93	Series Peaking Coil	11.5Ω		71526	19-3250	TV-185	6181	250 Microhenries
L94	Series Peaking Coil	27Ω		79185			4652	1 Microhenry
L95	Series Peaking Coil	53Ω		100448				1.7 Microhenries

Note 1. Part of complete assembly-complete antenna matching transformer Part #100454 includes L9 thru L15, C18 thru C21, Part #100454.
Note 2. Part of complete assembly-stator complete with rotor, L16 thru L26, C22 complete wafer Part #100697.
Note 3. Part of complete assembly-stator complete with rotor, L27 thru L35, C26-complete wafer Part #100698.
Note 4. Part of complete assembly-stator complete with rotor, L36, L37, C27, R30-complete wafer Part #100696.
Note 5. Part of complete assembly-stator complete with rotro, L37 thru L45, C29, C32, R36 complete wafer part #100694.
Note 6. Part of complete assembly-stator complete with rotor, L46 thru L53, C25, C35, C42 , R37 thru R40. Complete wafer Part #100695.
Note 7. Complete assembly-stator complete with rotor, Part #100693.
■ Parallel with 15KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA RCA Victor PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L76	85Ω		79161							Tapped @ 62Ω Horiz. Osc.
L77	46Ω		79966			6314				Horiz. Waveshaping Coil

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L96	.540A	25Ω	.75HY	100397					

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA RCA Victor PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	RADIO RECEPTOR PART No.	SARKES TARZIAN PART No.	NOTES
M1	.540ADC	100412	1319A	9RS600MSL	9S750 ①			① Drill new mtg. holes. Add mtg. bracket.
M2	.540ADC	100412	1319A	9RS600MSL	9S750 ①			

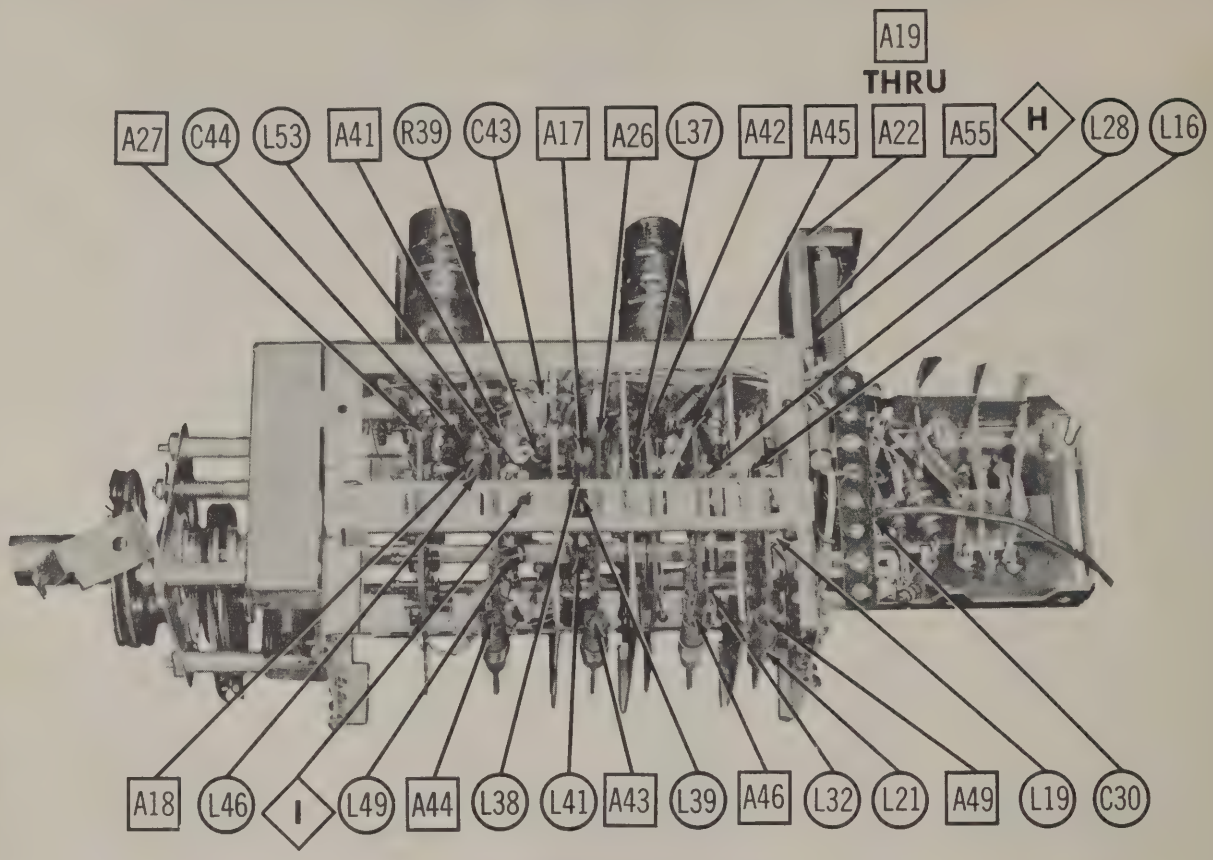
PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

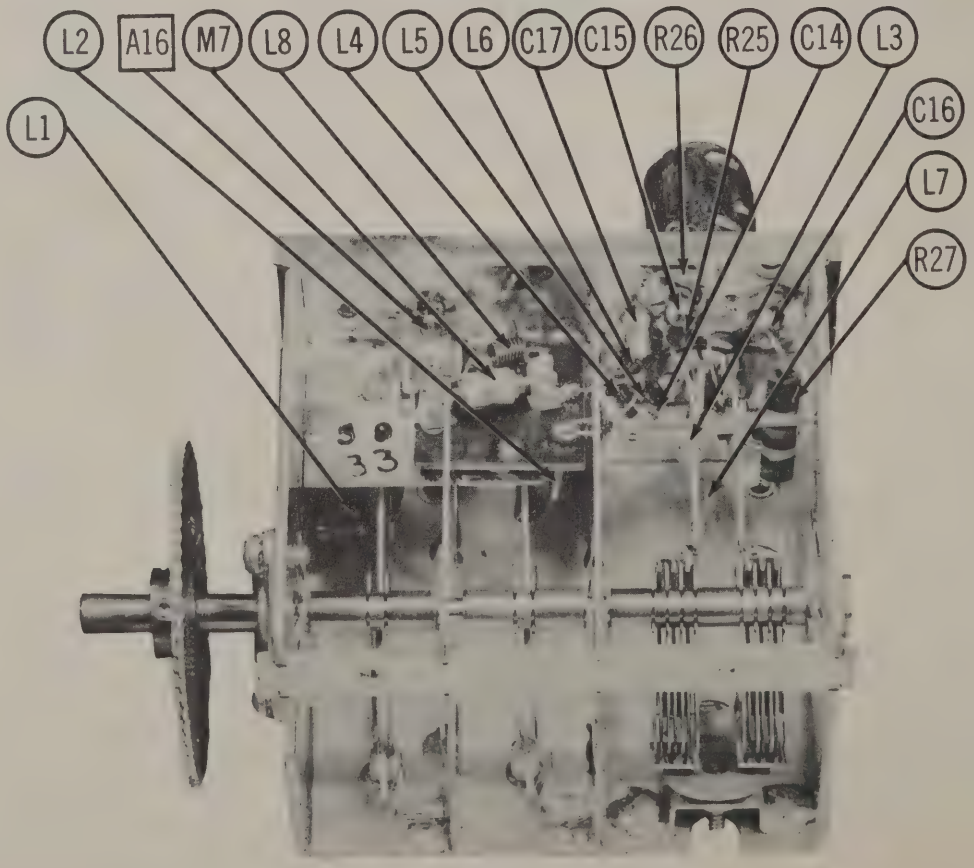
ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3		3"Piece #26 Wire	79358					
M4		3" Piece #26 Wire	79358					
M5	3AG	450MA 250V	79798	79641	312.500 (3AG $\frac{1}{2}$A)	357001	AGC$\frac{1}{2}$	4405
M6	3AG P/T	4.5A 250V	79357		318005. (3AG P/T 5A)		MDV5	

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M9	Crystal	100449	3579.545KC Osc.
M10	Dial Light	11891	#44
M11	Tuner	KRK-37	Includes both VHF & UHF sections
			VHF section only (part #KRK-35)
M12	Switch	100619	VHF-UHF (Slide type)
M13	Switch	100404	Width (SP-3 position-rotary, wafer type)
M14	Switch		High voltage interlock
M15	Delay Line	100451	Luminance channel
M16	Magnet	79604	Purity
M17	Magnet	79669	Blue beam lateral corrector
M18	Rim Purity Magnet Assy.	100929	
A13	Trimmer Cap.	100927	Video IF Input Trimmer
	Connector	100400	High voltage interlock & 18" long - polyethylene lead
	Connector	100403	High voltage and lead complete with 3 (22KΩ) filter resistors and nylon cap.
	Knob	79470	Brightness - For mahogany, maple and walnut instruments
	Knob	79444	Brightness - For birch, blonde tropical hardwood or oak instruments
	Knob	79508	Channel selector - For mahogany, maple and walnut instruments
	Knob	79509	Channel selector - For birch, blonde tropical hardwood instruments
	Knob	79465	Fine tuning
	Knob	79471	On-off-volume - For mahogany, maple and walnut instruments
	Knob	79445	On-off-volume - For birch, blonde tropical hardwood and oak instruments
	Knob	75945	Tone, contrast, hue and color
	Safety Glass	79591	Models 21CT661U, 21CT662U
	Safety Glass	101785	Models 21CT660U, 21CT663U, 21CT664U
	Mask	79587	Models 21CT661U, 21CT662U
	Mask	101784	Models 21CT660U, 21CT663U, 21CT664U



VHF TUNER-RIGHT SIDE



UHF TUNER-RIGHT SIDE

MISCELLANEOUS ADJUSTMENTS (cont.)

VERTICAL DYNAMIC CONVERGENCE ADJUSTMENTS

Recheck "Preliminary Convergence Adjustment" for correct setting of the three converging magnets and the blue beam positioning magnet to produce a white dot near the center of the screen (using a white dot generator).
Connect the RF output of a white dot generator across antenna terminals. Adjust for white dots on screen of picture tube. Refer only to a vertical row of dots near the center of the screen. Adjust the red vertical amplitude control maximum clockwise. Adjust the red vertical tilt control for maximum displacement of the red dots (near the center of the screen) from the cyan dots.
Adjust the green vertical amplitude control maximum clockwise and adjust the green vertical tilt control for maximum displacement of the green dots opposite the red. Connect a clip lead from the blue grid (pin 12) of the picture tube to chassis thru a 100KΩ resistor (terminals are provided to ground blue, green, and red grids at rear of chassis.) Adjust the green and red vertical amplitude and tilt controls for straight vertical rows of the green and red dots equally displaced. Adjust the green and red convergence magnets (small magnets mounted on a knurled nut in a horizontal position) for convergence of the green and red vertical rows of dots. If necessary, readjust green and red vertical tilt and amplitude controls to produce a single vertical row of (yellow) dots from top to bottom of screen.
Remove clip lead from blue grid of picture tube and chassis. Adjust the blue vertical amplitude control maximum clockwise. Adjust the blue vertical tilt and blue vertical amplitude controls alternately until the displacement of the blue dots is uniform with respect to the yellow dots in a vertical line.
Adjust the blue beam positioning magnet and the blue convergence magnet to converge vertically on the row of yellow dots. There should be one single row of dots (white) vertically from top to bottom of the screen. If necessary, repeat above adjustment of vertical convergence.

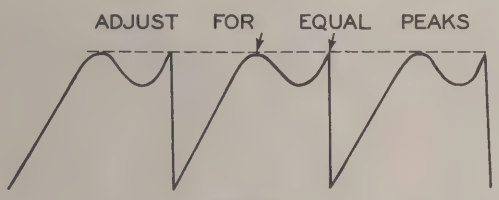


FIG. 15

HORIZONTAL DYNAMIC CONVERGENCE ADJUSTMENTS

Connect color dot generator as under "Vertical Dynamic Convergence". Use a horizontal row of dots near center of screen as reference.
Adjust the blue horizontal amplitude control maximum clockwise.
Adjust the blue horizontal phasing slug (B3) for the maximum downward displacement of the blue dots. Adjust the blue horizontal amplitude control and B3 alternately for a straight horizontal line of blue dots across the screen, downward from the green and red dots.
Connect a clip lead from red grid (pin 2) lead to chassis thru a 100KΩ resistor. Adjust the green horizontal amplitude control and the green horizontal phasing slug (B4) to provide a uniform displacement of the horizontal green dots with respect to the blue dots along a horizontal line.
Remove the clip lead from the red grid lead and connect it to the blue grid lead to chassis. Adjust the red horizontal amplitude control and the red horizontal phasing slug (B5) to provide a uniform displacement of the horizontal red dots with respect to the green dots.
Adjust the red and green convergence magnet adjustments for convergence of the red and green dots horizontally near center line of the screen. There should now be a single horizontal row of yellow dots near center of screen. Remove clip lead from blue grid lead of picture tube and chassis.
Adjust the blue convergence magnet and the blue beam positioning magnet (over blue gun near picture tube socket) to converge horizontally on the row of horizontal yellow dots, providing white dots. The vertical and horizontal dots should now show maximum coverage over the entire picture tube screen, providing white dots. Repeat, if necessary, adjustments under "Horizontal and Vertical Dynamic Convergence Adjustments" until maximum convergence is obtained.

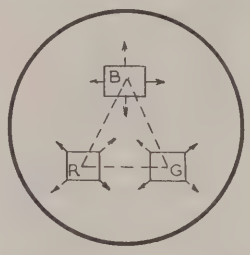
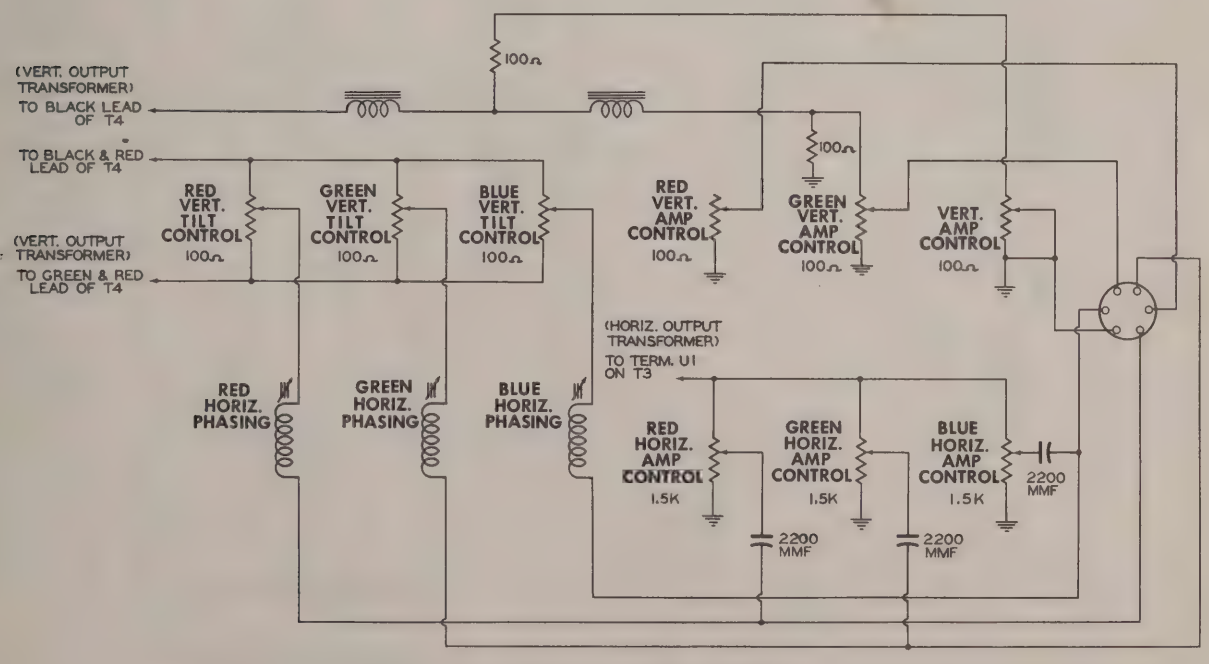


FIG. 16


100Ω
(VERT. OUTPUT TRANSFORMER) TO BLACK LEAD OF T4
TO BLACK & RED LEAD OF T4
(VERT. OUTPUT TRANSFORMER) TO GREEN & RED LEAD OF T4
RED VERT. TILT CONTROL 100Ω
GREEN VERT. TILT CONTROL 100Ω
BLUE VERT. TILT CONTROL 100Ω
RED VERT. AMP CONTROL 100Ω
GREEN VERT. AMP CONTROL 100Ω
VERT. AMP CONTROL 100Ω
(HORIZ. OUTPUT TRANSFORMER) TO TERM. U1 ON T3
RED HORIZ. PHASING
GREEN HORIZ. PHASING
BLUE HORIZ. PHASING
RED HORIZ. AMP CONTROL 1.5K
GREEN HORIZ. AMP CONTROL 1.5K
BLUE HORIZ. AMP CONTROL 1.5K
2200 MMF
2200 MMF
2200 MMF

ALTERNATE CONVERGENCE CIRCUIT USED WITH SOME VERSIONS

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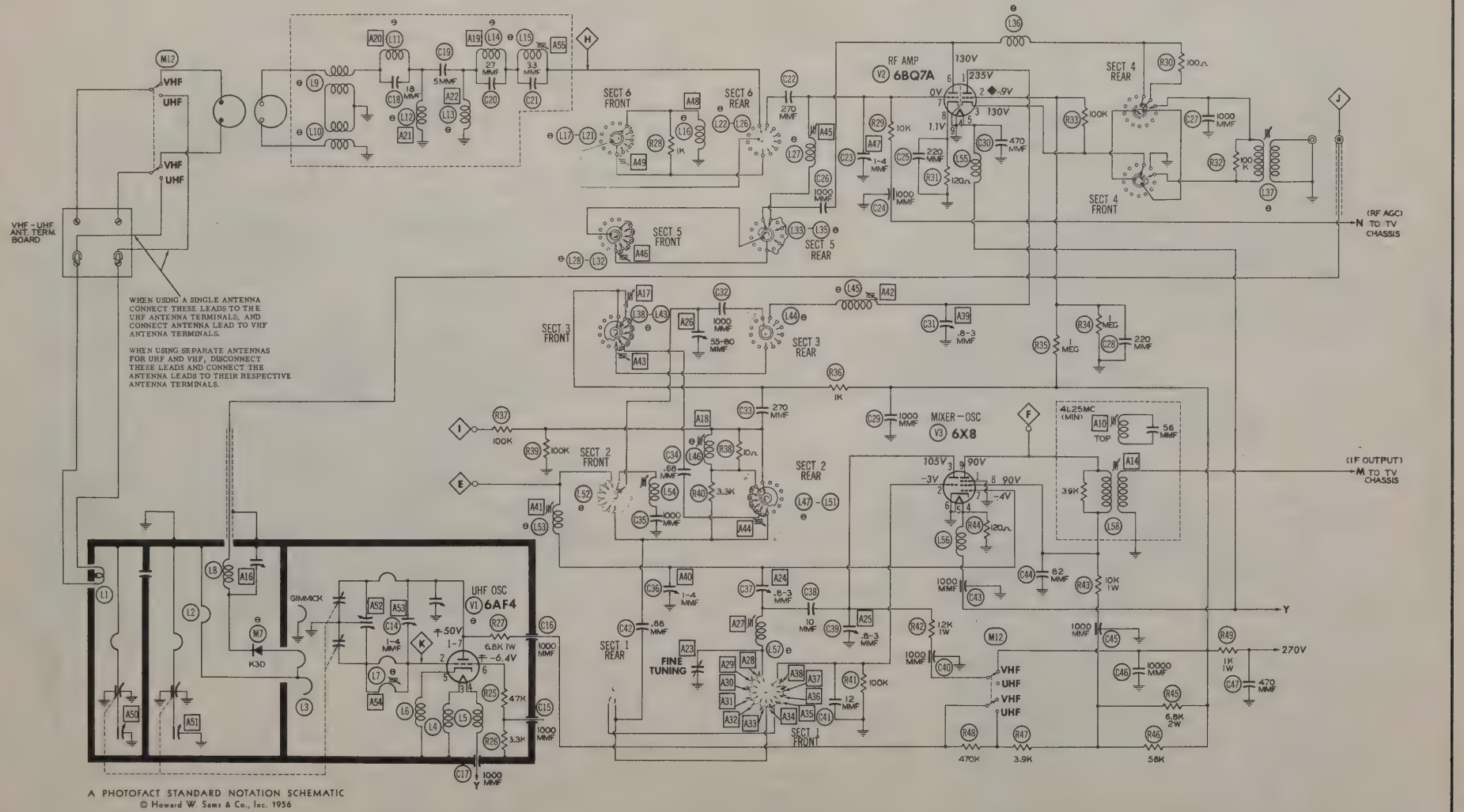
ALTERATE CONVERGENCE CIRCUIT SCHEMATIC


VHF - UHF ANT. TERM. BOARD
WHEN USING A SINGLE ANTENNA CONNECT THESE LEADS TO THE UHF ANTENNA TERMINALS, AND CONNECT ANTENNA LEAD TO VHF ANTENNA TERMINALS.
WHEN USING SEPARATE ANTENNAS FOR UHF AND VHF, DISCONNECT THESE LEADS AND CONNECT THE ANTENNA LEADS TO THEIR RESPECTIVE ANTENNA TERMINALS.
RF AMP V2 6BQ7A
MIXER-OSC V3 6X8
UHF OSC V1 6AF4
SECT 1 FRONT
SECT 1 REAR
SECT 2 FRONT
SECT 2 REAR
SECT 3 FRONT
SECT 3 REAR
SECT 4 FRONT
SECT 4 REAR
SECT 5 FRONT
SECT 5 REAR
SECT 6 FRONT
SECT 6 REAR
FINE TUNING
GIMMICK
K3D
(RF AGC) N TO TV CHASSIS
(IF OUTPUT) M TO TV CHASSIS
270V
41.25MC (MIN)
TOP
VHF
UHF
VHF
UHF

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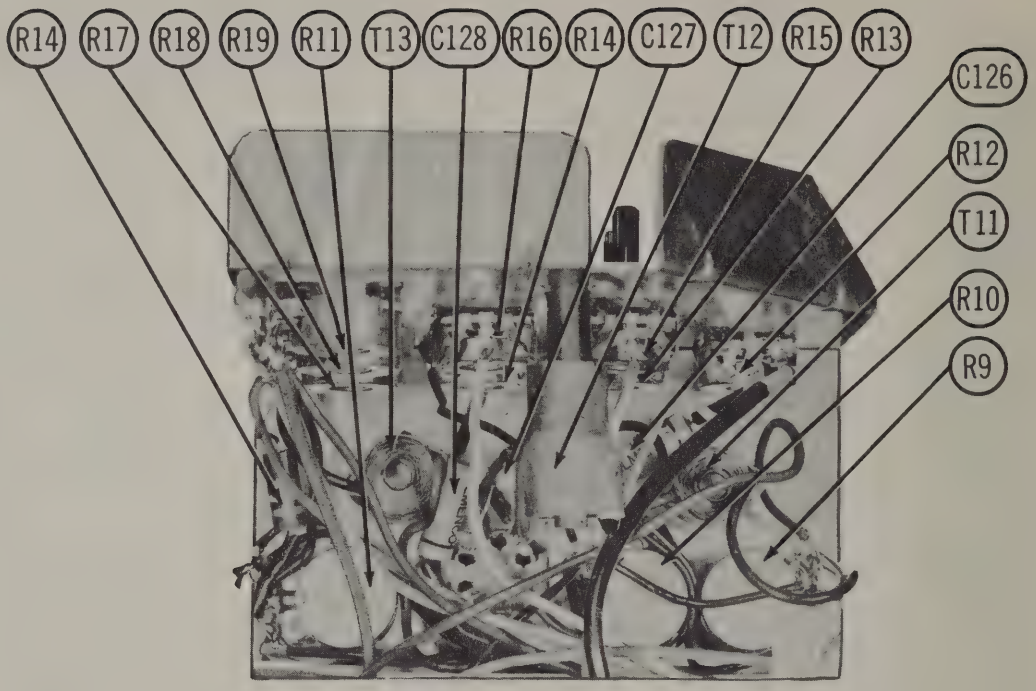
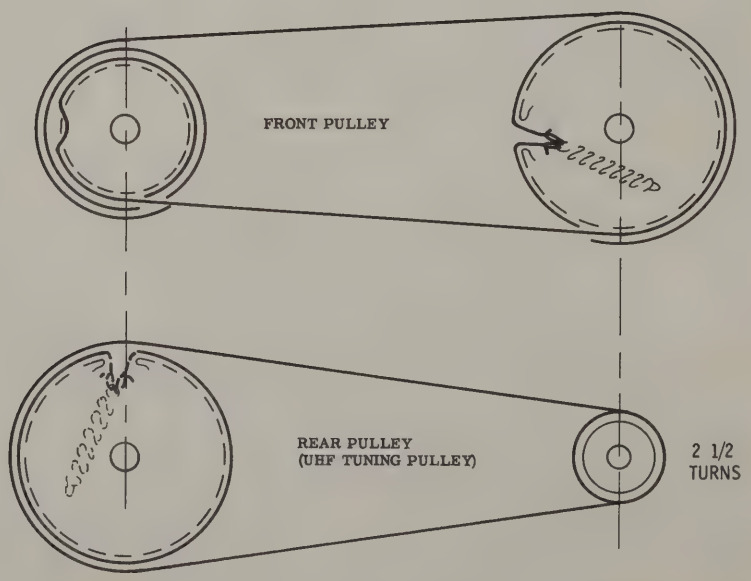
TUNER SCHEMATIC

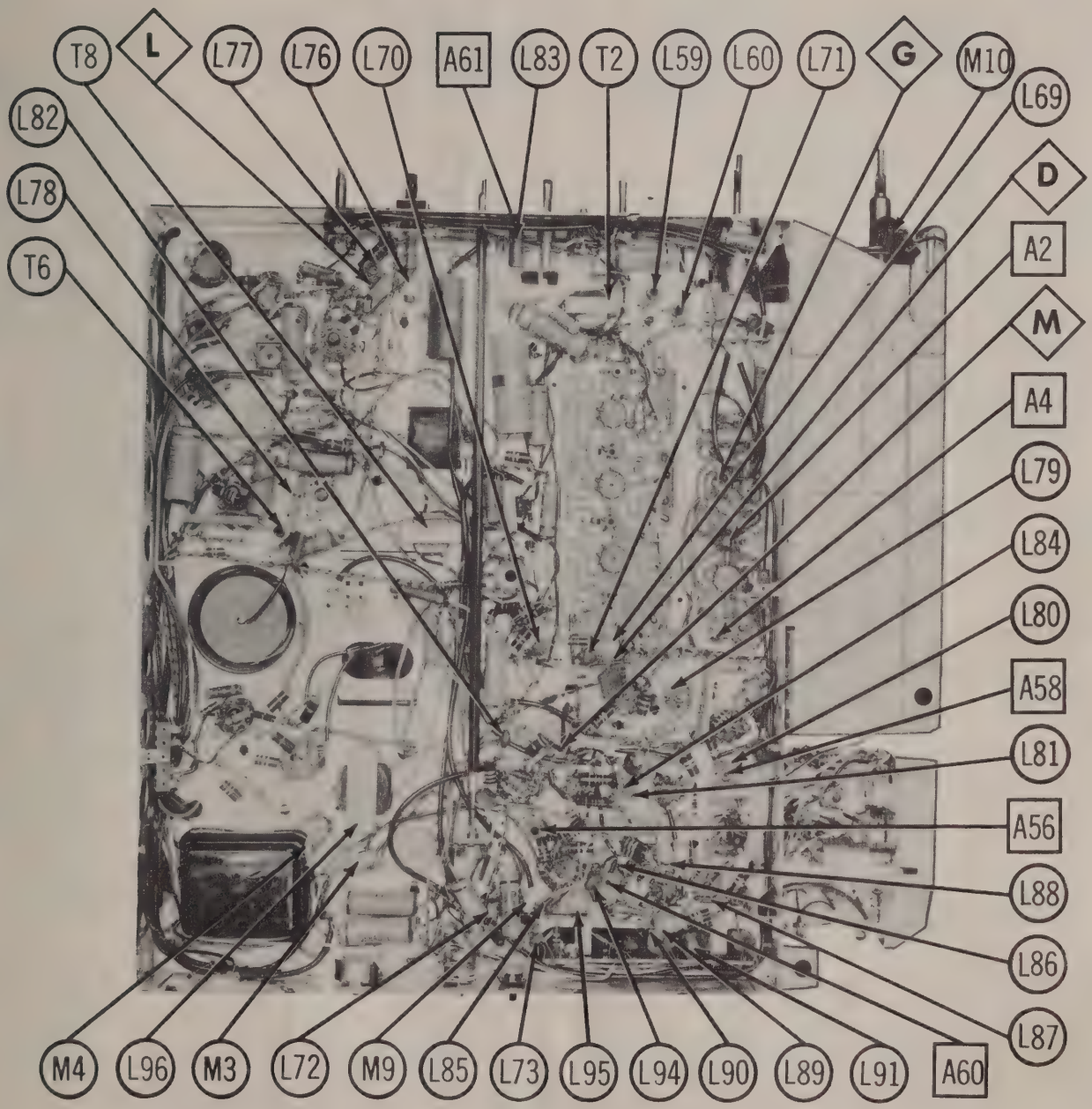


CONVERGENCE CHASSIS BOTTOM VIEW

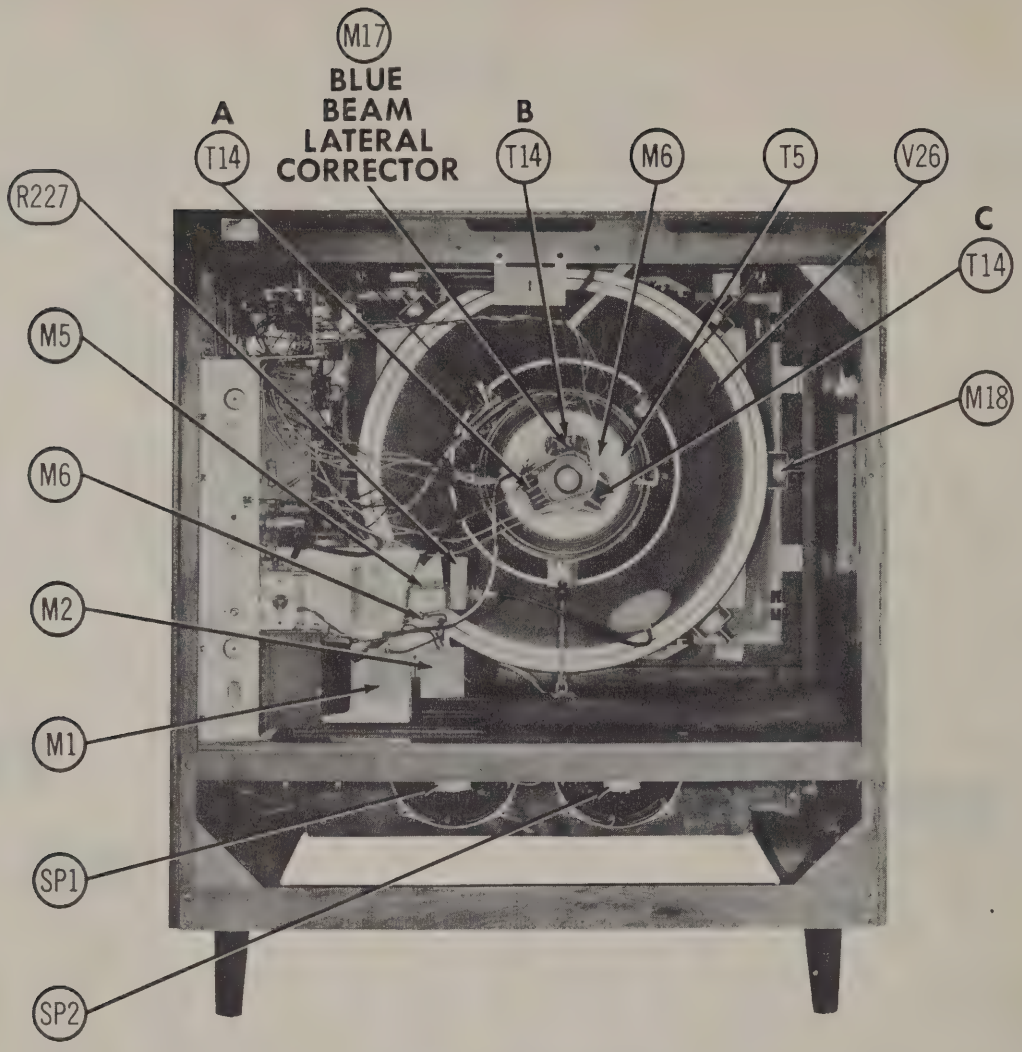


UHF TUNING PULLEY IN FULLY COUNTER CLOCKWISE POSITION

UHF DRIVE CORD STRINGING



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



CABINET—REAR VIEW

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs and UHF dial from front panel of cabinet.
2. Remove 8 wood screws and 2 metal screws. Remove rear cover.
3. Remove the cabinet top by taking the 3 bolts holding top in place; slide top to the rear 1 inch and lift off.
4. Disconnect H. V. lead, picture tube socket ; remove the yoke plug, speaker leads and the convergence yoke plug.
5. Loosen 2 wood screws. Remove antenna terminal bracket.
6. Remove 5 chassis bolts. Remove chassis.
7. Remove 8 speaker nuts. Remove 2 speakers.

PICTURE TUBE REMOVAL

1. Remove chassis as under chassis removal.
2. Lay cabinet face down on a soft surface.
3. Remove the blue beam positioning magnet and the purifying magnet assembly by sliding them from the neck of the picture tube.
4. Slide the convergence yoke assembly from the neck of the picture tube.
5. Loosen the (3) retaining rod thumb screws and disengage the rods from the retaining ring. Slide the retaining ring and yoke assembly from the neck of picture tube.
6. Unclip the ground lead to the front mask trim and loosen the screw holding the field equalizing magnet assembly Carefully slide assembly off from the front end of the picture tube insulator and remove.
7. Remove insulating shield and anode connector. Grasp the picture tube at the rear flange, and lift straight up and out of cabinet. Place picture tube face down on a soft pad ,then remove rubber ring cushion from around the front flange of the picture tube.

NOTE: Use extreme caution when removing the picture tube.

SENTINEL
MODEL 1U-364

SENTINEL
MODEL 1U-364

TRADE NAME	Sentinel Model 1U-364
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Four)	Types 12AU6 Converter, 12AV6 Det. -AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535KC-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02MFD	High side to antenna. Lug on tuning gang. Low side to B-.	455KC (400~ Mod.)	Tuning gang fully open	Across Voice Coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620KC	"	"	A3	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A4	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA		NOTES
		SENTINEL PART No.	STANDARD REPLACEMENT	
V1	Converter	12AU6	12AU6	
V2	Det. -AF Amp.	12AV6	12AV6	
V3	Output	50C5	50C5	
V4	Rectifier	35W4	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	SENTINEL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	25E83	PRS150V503020	BBRT5315C	TCT3117	TDL-532	FMT-327	TVA-3430
B	20	150							
C	20	15							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	47		23E4000-13	SI47	♦ D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C3A	220									
B	5000									
C	5000		♦ 23E2041-6	♦ PA-113-2	♦ PC-151	♦ 116TM2	♦ 1408-02		♦ DT-2	
D	250									
E										
C4	10000		23E4004-17	BPB-01	DD-103	KO82	811-01	DC-511	5HK-S1	
C5	.047	400	23E3414	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C6	.1	400	23E3416	P488N-1	DF-104	CUB4P1		PT401	4TM-P1	

♦ Items C3A, C3B, C3C, C3D, C3E, R3A, R3B and R3C are combined in one unit. When replacing items separately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	SENTINEL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	2Meg	½	28E120	AB-76	A47-1Meg-Z	Q13-139	U-55	Volume
B	Shaft		Not Req.	AK-4	KSS-3	Not Req.	Not Req.	Attach to R1A.

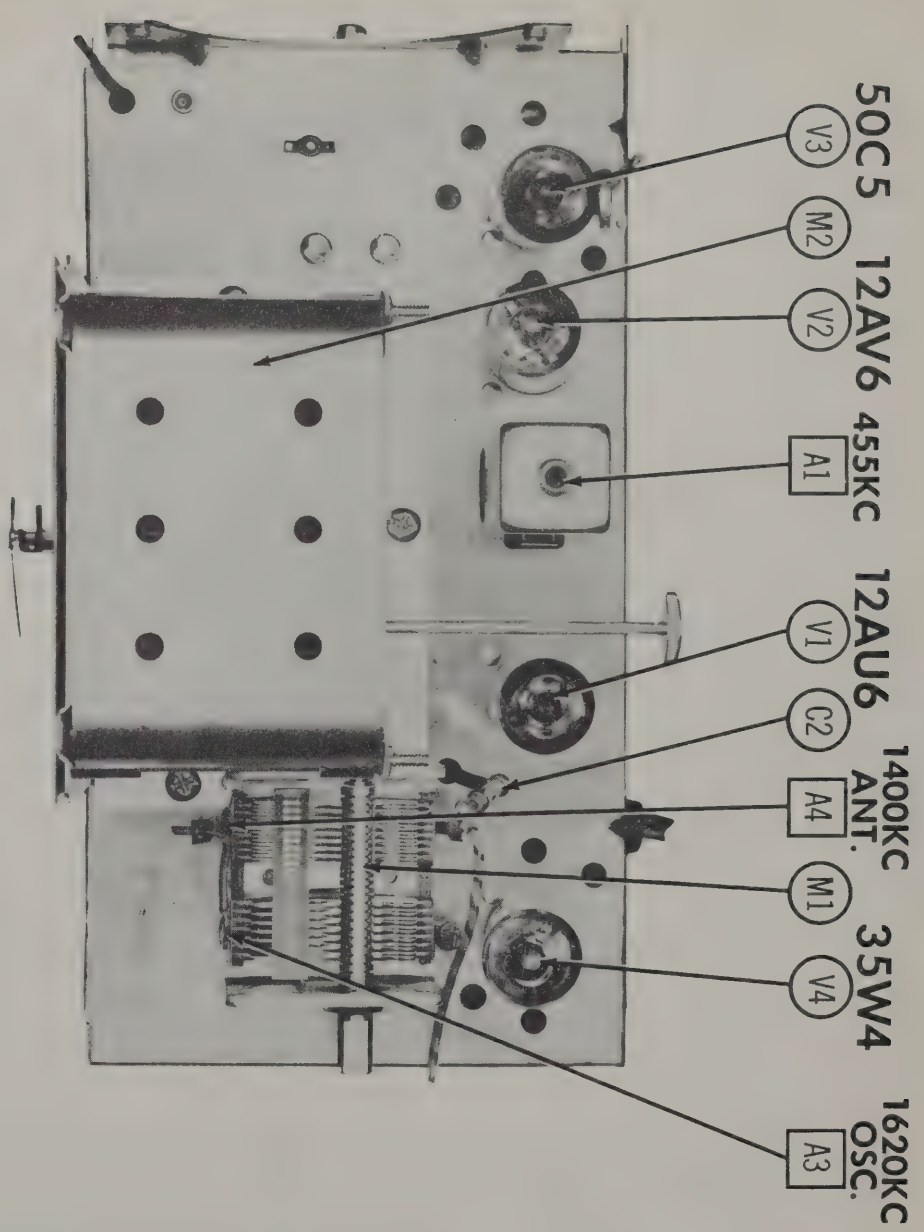
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R2	2.2Meg	½	27E225M½	BTS-2.2Meg	
R3A	6.8Meg			BTS-6.8Meg	
B	470KΩ		♦ 23E2041-6	BTS-470K	
C	470KΩ			BTS-470K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	SENTINEL PART No.	IRC PART No.	
R4	150Ω	½	27E151K½	BTS-150	
R5	2200Ω	½	27E222K½	BTS-2200	
R6	33Ω	½	27E330K½	BTS-33	
R7	68Ω	2	27E680K-2		

♦ Items R3A, R3B, R3C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	SENTINEL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.7KΩ	3.3Ω	22E88	Z1101	A3025	A3332	26S58	S-12X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	SENTINEL PART No.	QUAM PART No.	RCA TYPE No.	
SP1	3½"	PM	3.3Ω	1E64	3A07		

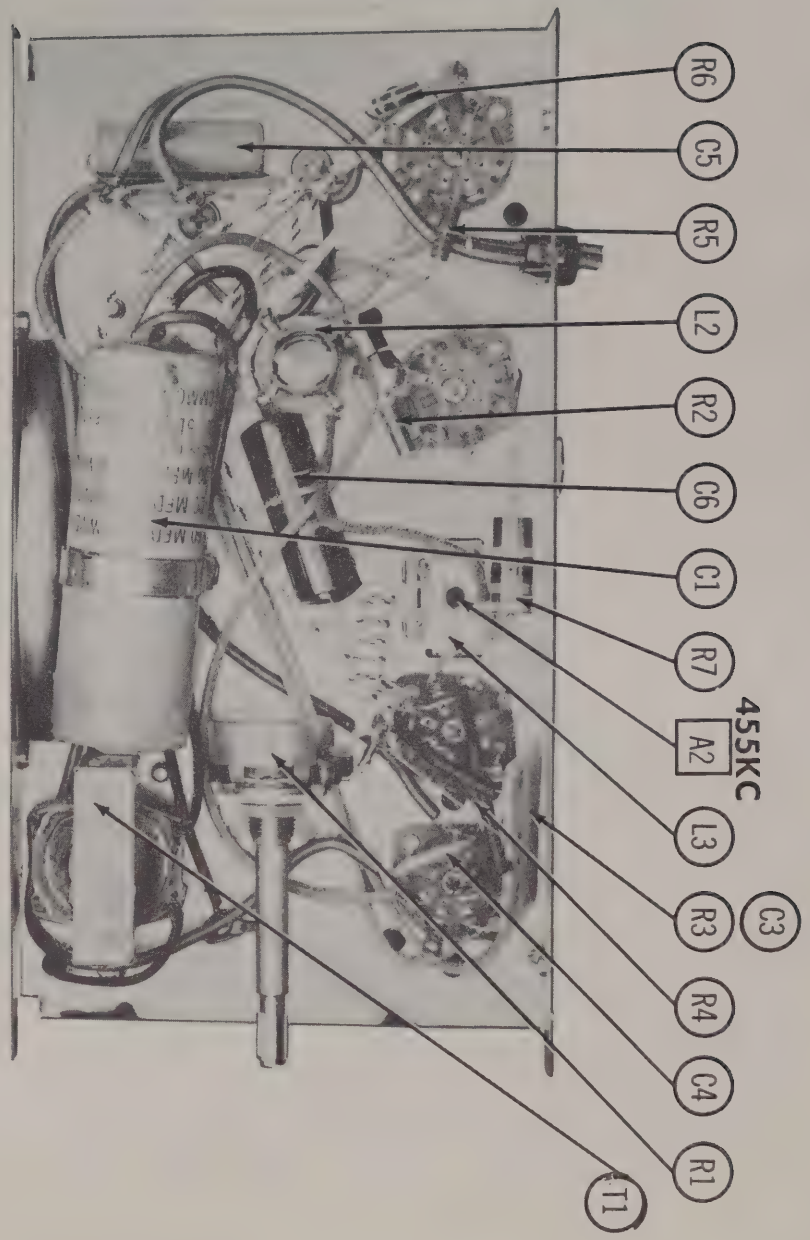
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	SENTINEL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.9Ω		64E37-3				Includes Cabinet Back Tertiary Winding=1.6Ω
L2	Osc. Coil	1Ω	7.8Ω	20E1011				
L3	IF Trans.	31Ω *	31Ω	20E1010				*Tapped @ 1.1Ω

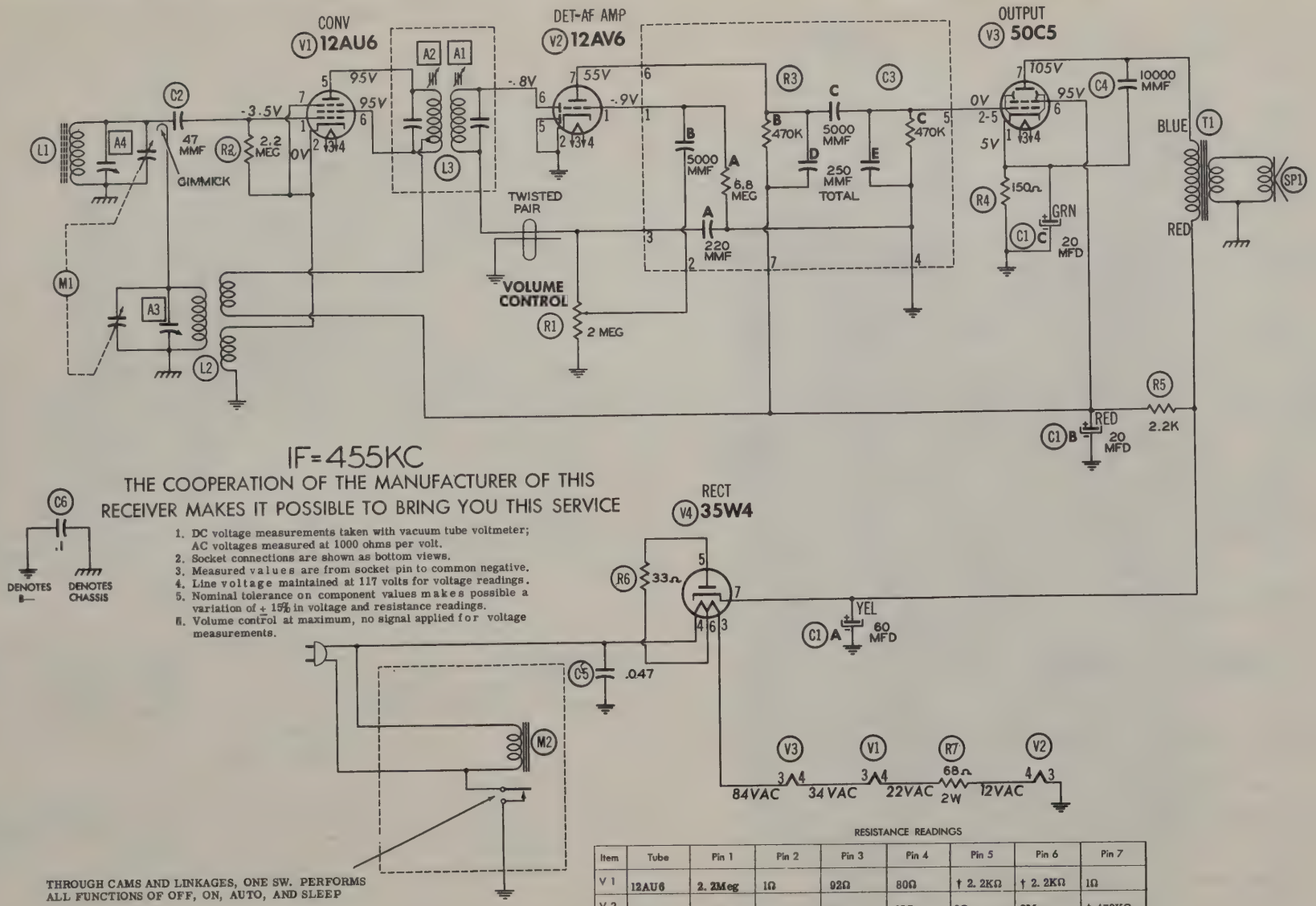
MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M1	Tuning Cap.	24E68	2 Gang (15-230MMF, 13-105MMF)
M2	Clock	61E19-2	
	Cabinet	7E464	Black
	Cabinet	7E464-2	Green
	Cabinet	7E464-3	Tan
	Cabinet	7E464-4	Ivory
	Cabinet	7E464-5	Mahogany
	Cabinet	7E464-6	Red
	Cabinet	7E464-7	Rust
	Cabinet	7E464-8	Yellow
	Knob	35E37-14	Station Selector-Black
	Knob	35E37-15	Station Selector-Green
	Knob	35E37-16	Station Selector-Tan
	Knob	35E37-17	Station Selector-Ivory
	Knob	35E37-18	Station Selector-Mahogany
	Knob	35E37-19	Station Selector-Red
	Knob	35E37-20	Station Selector-Rust
	Knob	35E37-21	Station Selector-Yellow
	Knob	37E47-19	Volume-Black
	Knob	37E47-20	Volume-Green
	Knob	37E47-21	Volume-Tan
	Knob	37E47-22	Volume-Ivory
	Knob	37E47-12	Volume-Mahogany
	Knob	37E47-14	Volume-Red
	Knob	37E47-25	Volume-Rust
	Knob	37E47-26	Volume-Yellow
	Knob	37E80-10	Clock
	Crystal	9E52	

CHASSIS—BOTTOM VIEW



SENTINEL MODEL IU-364



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	2.2Meg	1Ω	92Ω	80Ω	† 2.2KΩ	† 2.2KΩ	1Ω
V 2	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	2Meg	† 472KΩ
V 3	50C5	150Ω	470KΩ	142Ω	92Ω	470KΩ	† 2.2KΩ	† 220Ω
V 4	35W4	NC	NC	142Ω	177Ω	205Ω	172Ω	60KΩ

† MEASURED FROM PIN 7 OF V4.
NC-NO CONNECTION.

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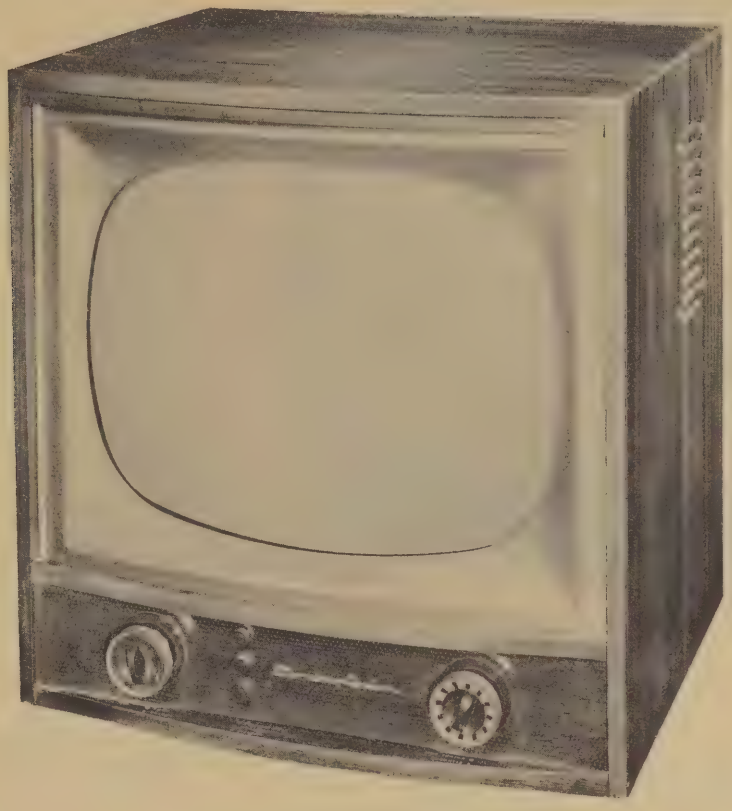

STROMBERG-CARLSON MODEL XP21 SERIES

TRADE NAME	Stromberg-Carlson Models XP21, XP22, X21, X22 Series
MANUFACTURER	Stromberg-Carlson Co., - Service Dept., 1700 University Ave., Rochester 10, N.Y.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING 1.72 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 1
Horizontal Sweep Circuit Adjustments 17
Parts List and Descriptions 12, 13, 14
Photographs
Cabinet-Rear View 17
Capacitor Identification 3, 10
Chassis-Top View 16
RF Tuner 15
Resistor Identification 4, 9
Photographs (Cont)
Trans., Inductor & Alignment Identification 16
Resistance Measurements 8
Servicing in the Field 1
Schematic (Alternate Tuner) 11
Schematic (TV) 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

STROMBERG-CARLSON MODELS
XP21, 22 Series, X21, 22 Series

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STROMBERG-CARLSON MODELS XP21, 22 Series, X21, 22 Series

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3921 LEYDE ST.
DENVER, COLORADO

MODELS

XP21, XP22, X21, X22 Series

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 7 push-on type control knobs from front panel of cabinet.

2. Remove 9 wood screws and 1 metal screw. Remove rear cover.

3. Remove 2 wood screws. Remove antenna terminal bracket.

4. Disconnect speaker leads. Remove 4 speaker nuts. Remove speaker.

5. Remove 4 chassis bolts. Remove chassis.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustments of the VHF tuner oscillator circuit may be accomplished by removal of the channel selector and fine tuning knobs. The adjustments are accessible, one at a time, thru the small hole in the cabinet above and slightly to the left of the channel selector shaft.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove 4 wood screws holding wood strip at the top edge of the safety glass. Remove wood strip and safety glass. Use extreme caution when removing safety glass.

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. Noise Cancellation Control Adjustment

All necessary horizontal sweep circuit adjustments should be made before adjustment of noise cancellation control.
Tune in strongest TV signal available.
Starting with the noise cancellation control (R9A) in its extreme counter clockwise position, turn R9A clockwise until the picture starts to distort or lose sync, then back counter clockwise until the picture is stable.

B. AGC Control Adjustment

Tune in a strong TV signal.
Adjust the AGC control (R9B)for minimum snow in picture.
In normal signal areas R9B should be left in its maximum counter clockwise position.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit may be made from the rear panel of the chassis. Set the horizontal hold control at its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A14) located on top of chassis.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

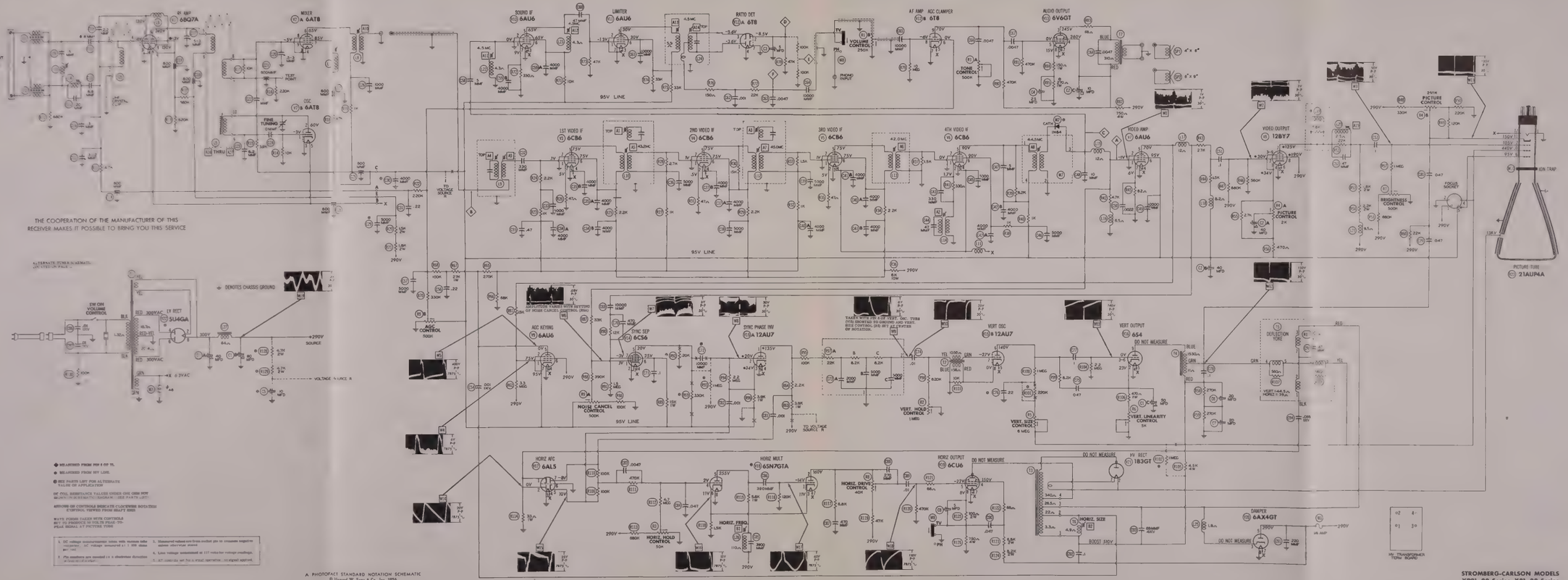
CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

STROMBERG-CARLSON MODELS
XP21, 22 Series, X21, 22 Series

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1956 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under international Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America


THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
RF AMP 6BQ7A
MIXER A 6AT8
OSC B 6AT8
SOUND IF 6AU6
LIMITER 6AU6
RATIO DET A 6T8
AF AMP AGC CLAMPER B 6T8
AUDIO OUTPUT 6V6GT
1ST VIDEO IF 6CB6
2ND VIDEO IF 6CB6
3RD VIDEO IF 6CB6
4TH VIDEO IF 6CB6
VIDEO AMP 6AU6
VIDEO OUTPUT 12BY7
PICTURE TUBE 21AUP4A
SYNC SEP 6CS6
SYNC PHASE INV A 12AU7
AGC KEYING 6AU6
VERT OSC B 12AU7
VERT OUTPUT 6S4
HORIZ AFC 6AL5
HORIZ MULT 6SN7GTA
HORIZ OUTPUT 6CU6
HV RECT 1B3GT
DAMPER 6AX4GT
LV RECT 5U4GA
DO NOT MEASURE
95V LINE
290V
STROMBERG-CARLSON MODELS
XP21, 22 Series, X21, 22 Series
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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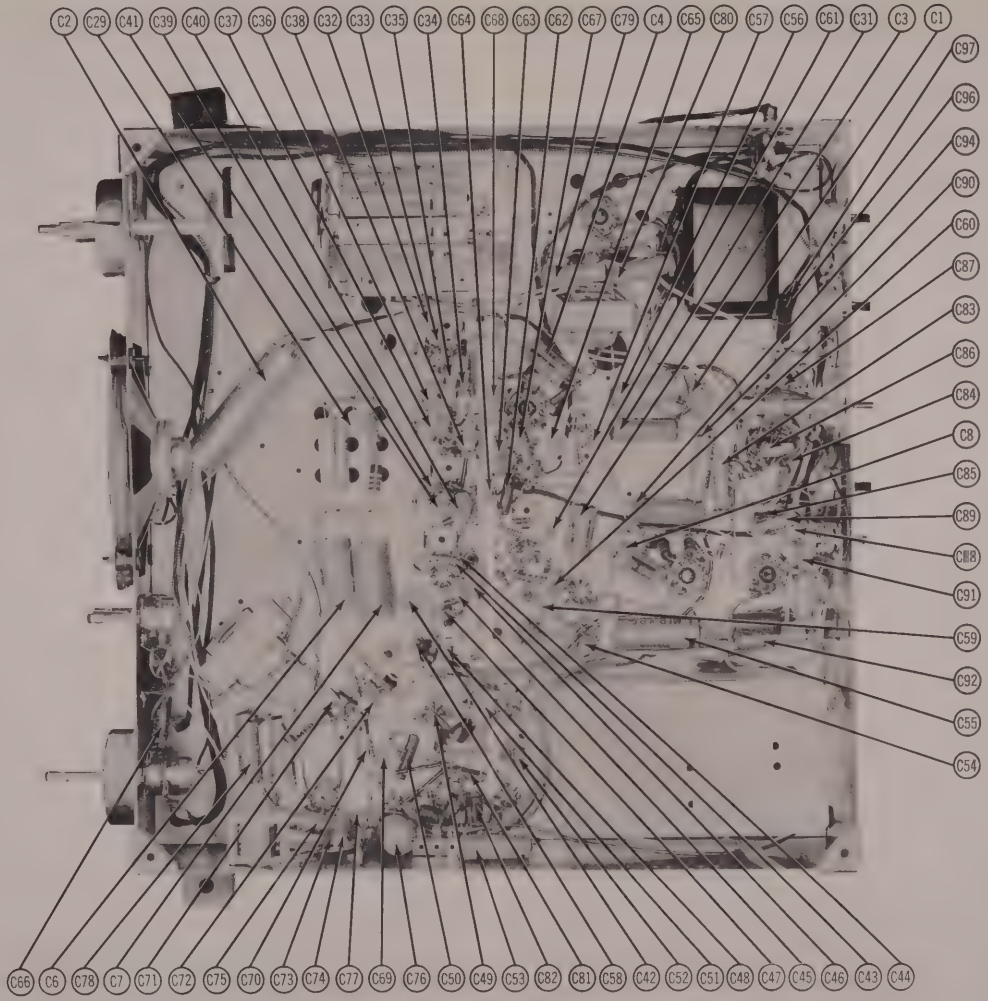
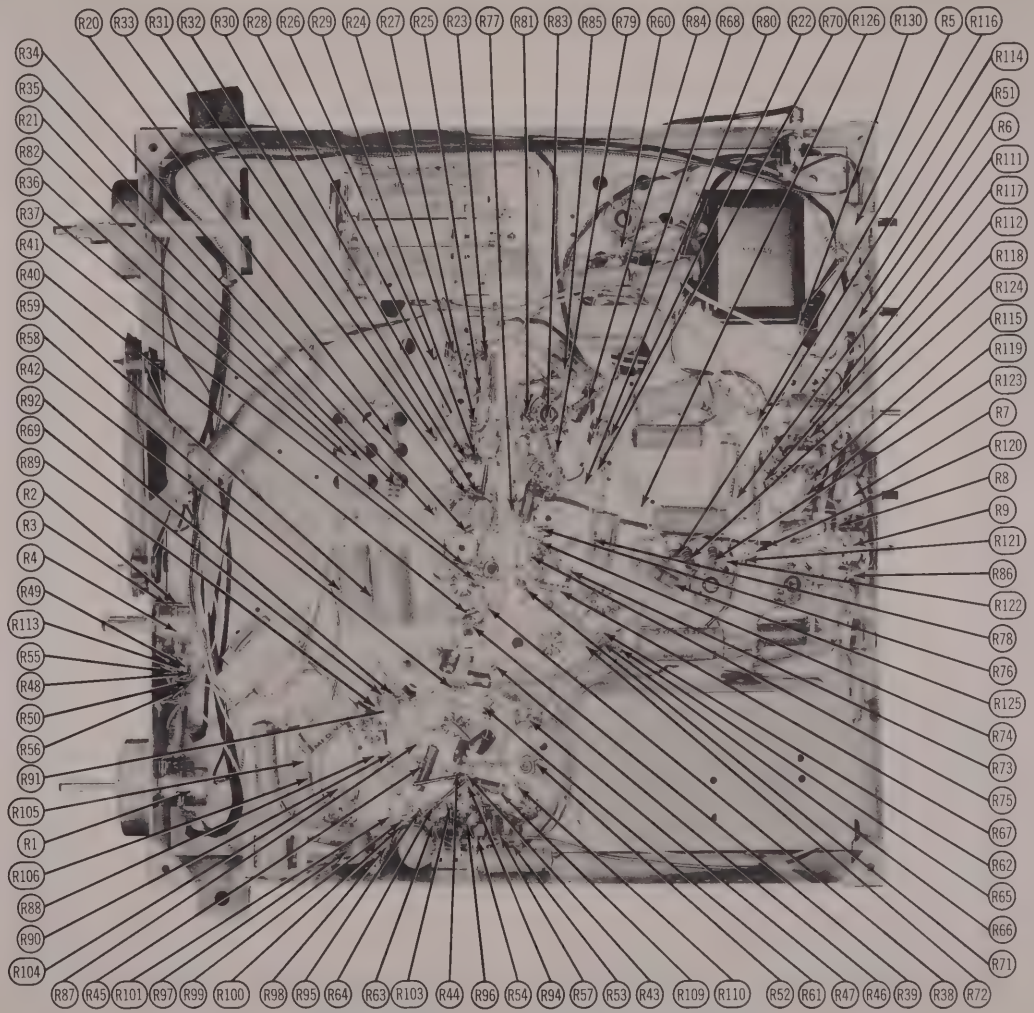
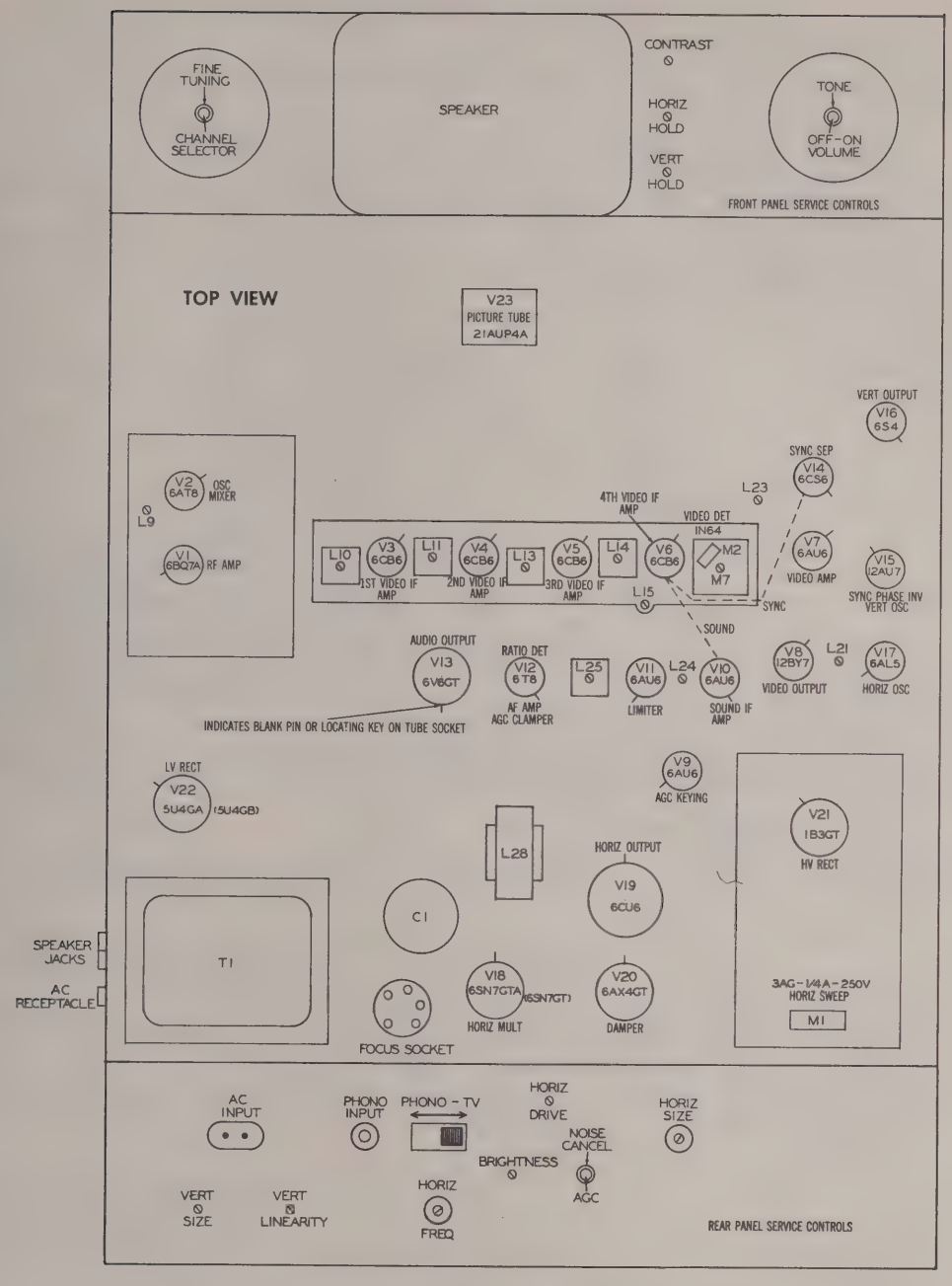


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V22

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V7, V8, V9, V23
Has pic, no sound - V10, V11, V12, V13
Overloaded picture - V9, V12

SYNC FAILURE
No vert. sync - V15
No horiz. sync - V15, V18
No vert. or horiz. sync - V14, V15

SWEEP FAILURE
No raster, has sound - V18, V19, V20, V21, V23, Fuse (M1)
No vertical deflection - V15, V16
Poor vert. linearity or foldover - V15, V16
Poor horiz. linearity or foldover - V18, V19, V20
Narrow picture - V18, V19, V20, V21, V22
Vert. off freq. - V15
Horiz. off freq. - V15, V17, V18

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

In the event the picture tube is removed the high voltage lead should be securely taped and kept away from chassis. Do not remove the horizontal multivibrator tube (V18) to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C55. Connect the positive lead to chassis. Attenuate the sweep generator output to maintain 2 volts peak to peak on scope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	100MMF	High side to pin 1 (grid) of 1st. Video IF amp. tube (V3). Low side to chassis.	Not used	41.25MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A1, A2	Adjust for MINIMUM 400∿ indication on scope.
2.	"	"	"	47.25MC	"	"	A3	"
3.	"	High side to point B. Low side to chassis.	"	39.75MC	"	"	A4	"
4.	"	High side to pin 1 (grid) of 1st. video IF amp. tube (V3). Low side to chassis.	"	43.2MC (Unmod)	"	USE VTVM DC probe thru 47KΩ to point (A). Common to chassis.	A5	Attenuate generator output to maintain not more than 1.5 volts at VTVM. Adjust for maximum deflection.
5.	"	"	"	42.0MC	"	"	A6	"
6.	"	"	"	45.0MC	"	"	A7	"
7.	"	"	"	44.5MC	"	"	A8	"
8.	"	"	44MC (10MC Swp)	39.75MC 41.25MC 41.9MC 45.75MC 47.25MC	"	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.		Check for response similar to Fig. 1. If necessary, retouch A5 thru A8 to obtain desired response. A5 affects top position of curve. A6 affects low frequency side. A7 affects high frequency side. A8 affects bandwidth. Increase generator output and check 39.75MC, 41.25MC and 47.25MC marker positions. (Fig.1).
9.	Direct	High side to an ungrounded tube shield floating over converter tube (V2). Low side to chassis.	"	41.9MC 45.75MC	"	"	A9, A10	Adjust A9 and A10 for response curve similar to Fig. 2.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±1%) resistors in series from point (D) to chassis. The junction of these two resistors is alignment point (F) as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.01MFD	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to point (D). Common to chassis.	A11, A12, A13	Attenuate generator output to maintain 1.5 volts at VTVM. Adjust for maximum deflection.
11.	"	"	"	"	DC probe to point (E). Common to point (F).	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	.01MFD	High side to point (C). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any non-interfering channel	Vert. Amp. to point (D). Low side to chassis.	A11, A12, A13	Disconnect stabilizing capacitor (C3). Adjust for curve of maximum amplitude and symmetry similar to Fig. 3.
11.	"	"	"	"	"	Vert. Amp. to point (E). Low side to chassis.	A14	Reconnect C3. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 4. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

Set contrast control for maximum.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to point (A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any non-interfering channel	Vert. Amp. thru detector (Fig. 6) to pin 2 (grid) of picture tube. Low side to chassis.	A15	Adjust for MINIMUM 400∿ indication on scope.

ALIGNMENT INSTRUCTIONS (cont)

VHF OSCILLATOR ALIGNMENT

In VHF tuner #171859 complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A28. (NOTE: Adjustment A28 not in VHF tuner #164044.) It should be noted that this (A28) is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A28 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just above the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.

Leave bias connected as under "Video IF Alignment".

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
13	Two 120Ω Carbon Resistors	Across antenna terminals with 120 Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 47KΩ to point (A). Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 5. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

VHF RF AND MIXER ALIGNMENT

The VHF RF and Mixer Tuner portions of this receiver have been properly aligned at the factory and are very stable. Alignment of these portions should not be required in the field.

UHF TUNER ALIGNMENT

The UHF Tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion is not recommended in the field.

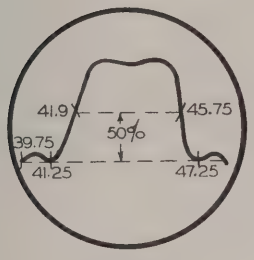


FIG. 1

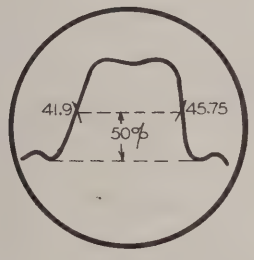


FIG. 2

FIG. 3

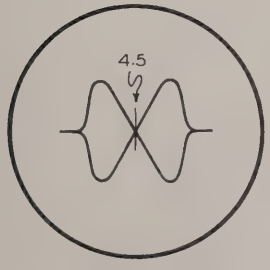


FIG. 4

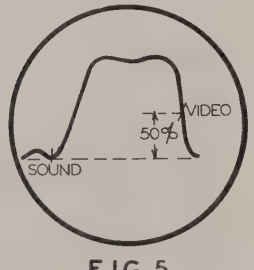


FIG. 5

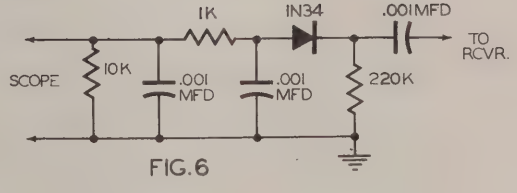
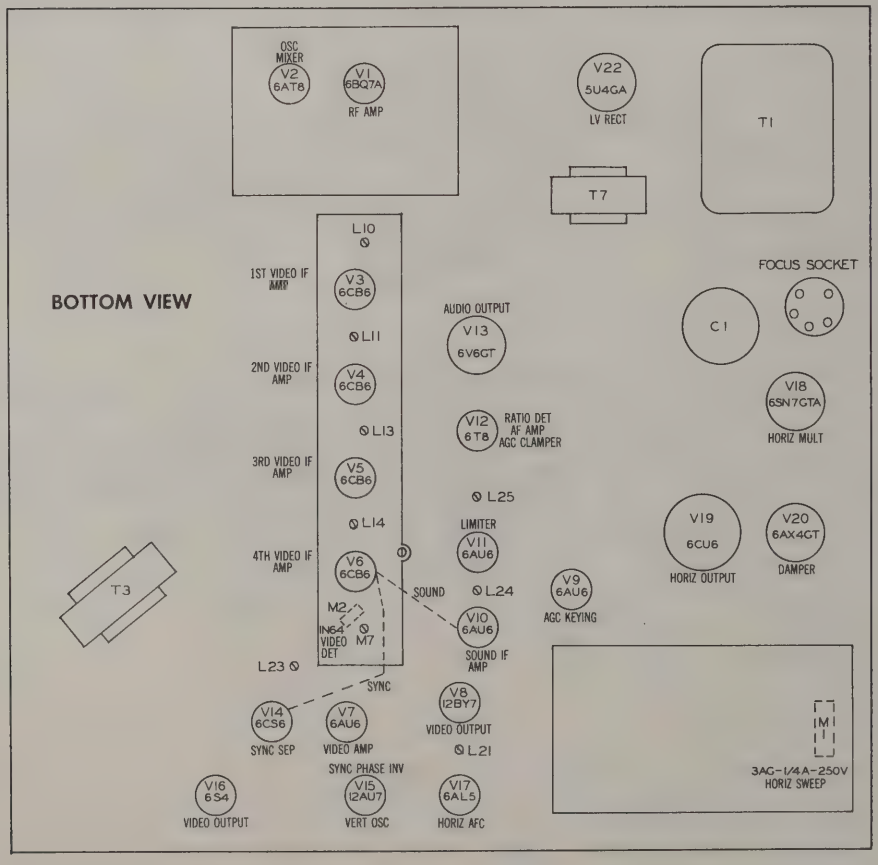


FIG. 6

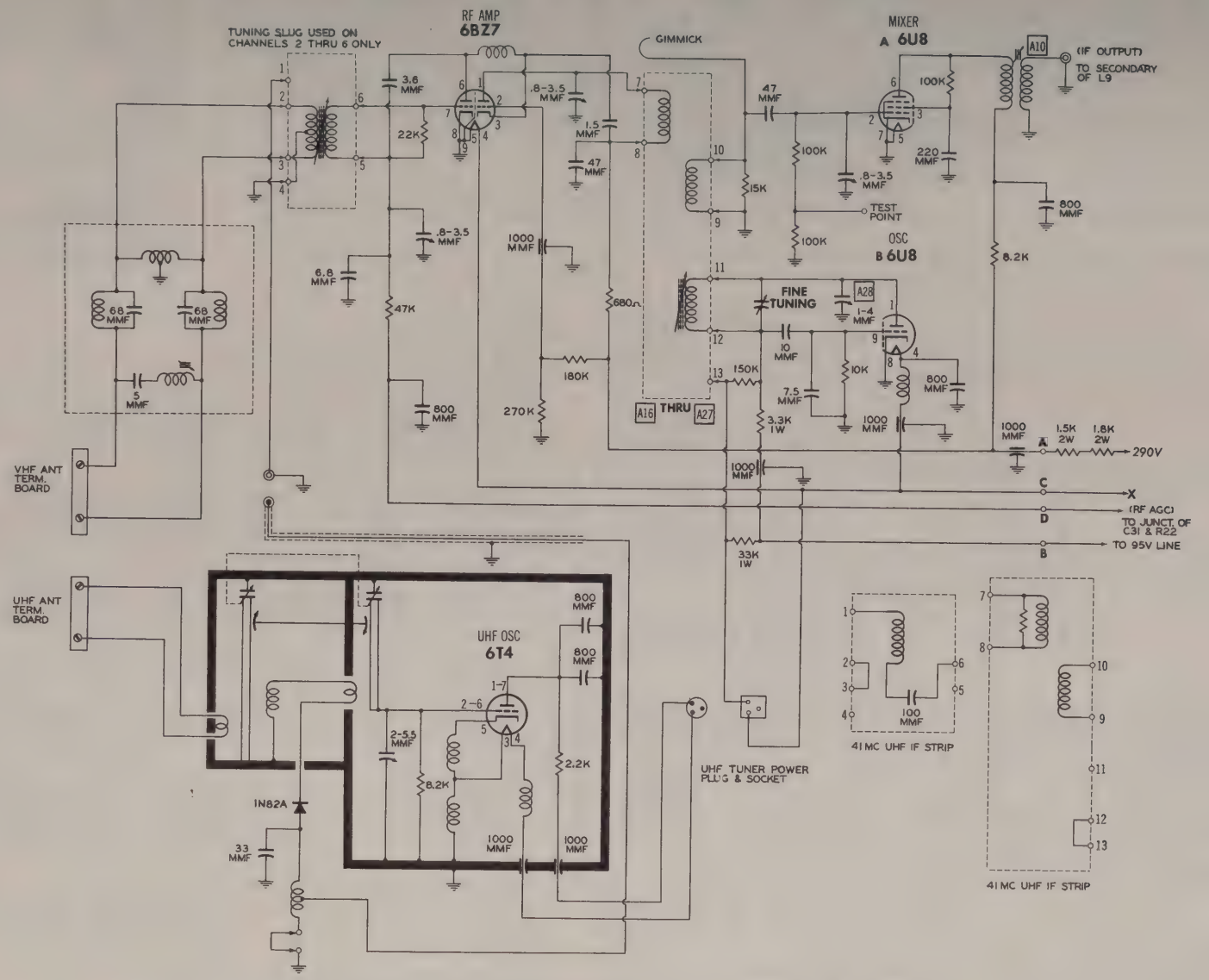
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7A	INF	500KΩ	0Ω	0Ω	.1Ω	† 3.4KΩ	400KΩ	INF	400KΩ
V 2	6AT8	10KΩ	■ 3.9KΩ	0Ω	0Ω	.1Ω	■ 1KΩ	■ 47KΩ	0Ω	220KΩ
V 3	6CB6	70KΩ	47Ω	0Ω	.1Ω	† 8.2KΩ	† 8.2KΩ	0Ω		
V 4	6CB6	70KΩ	47Ω	0Ω	.1Ω	† 8.2KΩ	† 8.2KΩ	0Ω		
V 5	6CB6	70KΩ	47Ω	0Ω	.1Ω	† 8.2KΩ	† 8.2KΩ	0Ω		
V 6	6CB6	.1Ω	330Ω	0Ω	.1Ω	■ 1KΩ	■ 1KΩ	0Ω		
V 7	6AU6	4.7KΩ	0Ω	0Ω	.1Ω	■ 4.2KΩ	40KΩ	82Ω		
V 8	12BY7	40KΩ	370KΩ	40KΩ	0Ω	0Ω	.1Ω	† 4KΩ	† 64Ω	40KΩ
V 9	6AU6	■ 20KΩ	40KΩ	0Ω	.1Ω	220KΩ	† 64Ω	40KΩ		
V 10	6AU6	4.3Ω	0Ω	.1Ω	0Ω	■ 10KΩ	■ 10KΩ	330Ω		
V 11	6AU6	47KΩ	0Ω	.1Ω	0Ω	■ 25KΩ	■ 25KΩ	0Ω		
V 12	6T8	INF	47KΩ	INF	0Ω	.1Ω	220KΩ	0Ω	10Meg	† 470KΩ
V 13	6V6GT	TP	0Ω	† 1.2KΩ	† 800Ω	470KΩ	TP	.1Ω	420Ω	
V 14	6CS6	40KΩ	0Ω	0Ω	.1Ω	■ 120KΩ	■ 15KΩ	1.5Meg		
V 15	12AU7	† 6.2KΩ	2.2Meg	40KΩ	.1Ω	.1Ω	▲ 2.2Meg	1.5Meg	156Ω	0Ω
V 16	6S4	NC	1.6KΩ	2.2Meg	0Ω	.1Ω	2.2Meg	NC	NC	▲ 6KΩ
V 17	6AL5	33Ω	33Ω	0Ω	.1Ω	5Meg	0Ω	5Meg		
V 18	6SN7GTA	120KΩ	† 90KΩ	1.5KΩ	5Meg	† 5.6KΩ	1.5KΩ	.1Ω	0Ω	
V 19	6CU6	NC	0Ω	NC	† 15KΩ	470KΩ	NC	.1Ω	100Ω	TOP CAP ▲ 28Ω
V 20	6AX4GT	NC	NC	550KΩ	TP	† 64Ω	TP	.1Ω	0Ω	
V 21	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ▲ 370Ω
V 22	5U4GA	NC	200KΩ	NC	19Ω	NC	20Ω	NC	200KΩ	
V 23	21AUP4A	0Ω	† 1.5Meg	PIN 6 40KΩ	PIN 10 ▲ 4.5KΩ	PIN 11 250KΩ	PIN 12 .1Ω			

† MEASURED FROM PIN 8 OF V22.
■ MEASURED FROM 95V LINE.
▲ MEASURED FROM PIN 3 OF V20.
NC-NO CONNECTION.
TP-TIE POINT.



TUBE PLACEMENT CHART



UHF TUNER PART NO. 171860, VHF TUNER PART NO. 171859 USED WITH MODELS X22, AND XP22

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ALTERNATE VHF-UHF TUNER SCHEMATIC

STROMBERG-CARLSON MODELS XP21, 22 Series, X21, 22 Series

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	REPLACEMENT DATA Stromberg-Carlson PART No.	STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BQ7A	6BQ7A	
V2	Mixer-Oscillator	6AT8	6AT8	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6CB6	6CB6	
V5	3rd. Video IF Amplifier	6CB6	6CB6	
V6	4th. Video IF Amplifier	6CB6	6CB6	
V7	Video Amplifier	6AU6	6AU6	
V8	Video Output	12BY7	12BY7	
V9	AGC Keying	6AU6	6AU6	
V10	Sound IF Amplifier	6AU6	6AU6	
V11	Limiter	6AU6	6AU6	
V12	Ratio Detector- AF Amp.- AGC Clamper	6T8	6T8	
V13	Audio Output	6V6GT	6V6GT	
V14	Sync Separator	6CS6	6CS6	
V15	Sync Phase Inverter-Vert. Oscillator	12AU7	12AU7	
V16	Vert. Output	6S4	6S4	
V17	Horiz. AFC	6AL5	6AL5	
V18	Horiz. Mult.	6S7GTA	6S7GTA	6S7GT may be used as an alternate.
V19	Horiz. Output	6CU6	6CU6	
V20	Damper	6AX4GT	6AX4GT	
V21	HV Rectifier	1B3GT	1B3GT	
V22	LV Rectifier	5U4GA	5U4GA	5U4GB may be used as an alternate.

CATHODE-RAY TUBE

ITEM No	REPLACEMENT DATA Stromberg-Carlson PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	NOTES
V23	21AUP4A ①	21AUP4A ①	21AUP4A ② ① Aluminized 21AUP4A/B ② Silver screen "95" ③ 21AUP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	FYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	±40	450	111129		BD48	FP564.5	TM-B040-450	D-256	TVL-3250
B	±80	450			BR505	TC39	TD-50-50	FM-0850	TVA-1308
C	±50	50							
C2A	±40	250	111138		XB011	FP231	TM-D40-250	D-115	TVL-2520
B	40	250			BR1048	TC72	TD-10-450	FM-4510	TVA-1705
C	±10	450							
C3	5	50	111093		SRE50Y5	BR550	TC50	TD-5-50	MMT-0505	TVA-1303
C4	25	25	111069		PRS35Y25	BR252	TC25	TD-25-25	FM-0325	TVA-1205
C5	10	500	111153 (Note 1)		PRS500Y10	BR2503	TC93	TD-10-50	S-310	TVA-1303
C6	20	300	111089		PRS450Y20	BR2035	TC75	TD-20-350	FM-4520	TVA-1508
C7	20	300	111069		PRS450Y20	BR2035	TC75	TD-20-350	FM-4520	TVA-1508
C8	50	50	111093		SRE50Y5	BR550	TC50	TD-5-50	MMT-0505	TVA-1303

Note 1. Not used in some versions.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C9	5			NPO-D15	TCZ-5	Z01J	NPOA-050	ZT-555	5TCCB-V5	
C10	8.8			NPO-D09.2	TCZ-8R8	Z01J	NPOA-8R8	ZT-5588	5TCCB-V88	
C11	8.8			NPO-D09.2	TCZ-8R8	Z01J	NPOA-8R8	ZT-5588	5TCCB-V88	
C12	8.8			NPO-D09.2	TCZ-8R8	Z01J	NPOA-8R8	ZT-5588	5TCCB-V88	
C13	8.8									
C14	500									
C15	3.3			NPO-SI3.3	TCZ-3R3	Z06K	NPOA-3R3		5TCCB-V33	
C16	3.			NPO-D13	TCZ-3R3	Z007	NPOA-030	ZT-553	5TCCB-V33	
C17	5-3				839-3		315-01-0R5	CT565A		
C18	800									
C19	500						315-01-0R5			
C20	5-3				839-3			CT565A		
C21	800									
C22	1			NPO-SI	TCZ-1	TZ03	NPOA-010		5TCCB-V1	
C23	8.3			NPO-SI8.3		Z01J	NPOA-8R3			
C24	10			NPO-DI0	TCZ-10	Z01J	NPOA-100	ZT-561	5TCC-Q1	
C25	800									
C26	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C27	800									
C28	800									
C29	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	Note 2
C30	4000			BPD-004	DD-402	K078	811-004	DC-524	5HK-D4	Note 2
C31	.33	300	110707	P3S33-.22		CU33P222		DT6S4	2TM-P22	
C32	330		110463	S2330	D6-331	TP43	GP2K-331	DC-5333	5GA-T33	
C33	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C34A	4000		110585	BPD-4X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000				D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
C36	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C37A	4000		110585	BPD-4X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000				D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
C38	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C39	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C40A	4000		110585	BPD-4X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000				D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
C41A	4000		110585	BPD-4X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000				D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
C42A	4000		110585	BPD-2X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000				D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
C43	330			S2330	D6-331	TP43	GP2K-331	DC-5333	5GA-T33	
C44	47			S247	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C45	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C46	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C47	5		110598	NPO-SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C48	10		110649	NPO-SI10	D6-100	TZ09	NPOA-100	ZT-541	5TCC-Q1	
C49	10000		110672	BPD-01	DD-102	K083	811-01	DC-511	5HK-E1	
C50	.0033	400	110714	BPD-0S33	D6-332	CUB3D33	GP3-333-332	DT6332	6TM-D33	
C51	.1	400	110646	P4S33-.1	DF-104	CUB4P1		PT501	4TM-P1	
C52	47			NPO-S147	TCZ-47	TZ33	NP0K-470	ZT-5447	5TCC-Q47	
C53	.1	400	110724	P4S33-.1	DF-104	CUB4P1		PT501	4TM-P1	
C54	.001	1000	110562	HVD-15-100	DD-102	CUB15D1	1R5KV-103	PT1521	10GA-D1	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING CAP.	VOLT	Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C55	.47	300	110709	P3S8N-47		CU3S2P47		PT4047	2TM-P47	
C56	.33	400	110736	P4S8N-33		CU3W333		PT4033	4TM-P33	
C57	5000		110586	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C58	5		110598	NPO-D05	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C59A	4000		110585	BPD-2X004	D6-402 D6-403	DK078	832-004	DCD-534	5HK-ID4	
B	4000									
C60	47		110403	BPD-000047	D6-470	TP29	GP1K-470	UC-5447	5GA-Q47	
C61	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	
C62	.001	400	110534	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C63	.0047	400	110716	BPD-0047	D6-472	CUB6D47	GP3-333-473	PT6247	6TM-D47	
C64	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	
C65	10000		110672	BPD-01	DD-103	K083	811-01	DC-511	5HK-E1	
C66	.0047	400	110716	BPD-0047	D6-472	CUB6D47	GP3-333-473	PT6247	6TM-D47	
C67	.0047	400	110716	BPD-0047	D6-472	CUB6D47	GP3-333-473	PT6247	6TM-D47	
C68	.0047	400	110716	BPD-0047	D6-472	CUB6D47	GP3-333-473	PT6247	6TM-D47	
C69	10000		110672	BPD-01	DD-103	K083	811-01	DC-511	K083	
C70	470		110464	S2470	D6-471	TP46	GP2K-471	UC-5547	5GA-T47	
C71	.1	400	110734	P4S8N-.1	DF-104	CUB4P1		PT401	4TM-P1	
C72	10000		110672	BPD-01	DD-103	K082	811-01	DC-511	5HK-E1	Note 1
C73A	3000		±133200	±PA-130	±PC-100	±115TM1	±1405-01	DC-535 DC-525	±V-1 ±V-2	
B	5000		±133200	±PA-130	±PC-100	±115TM1	±1405-01	DC-535 DC-525	±V-1 ±V-2	
C	5000									
C74	.01	400	110718	BPD-01	D6-103	CUB5A1	GP3-333-103	PT431	6TM-S1	
C75	.047	600	110741	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C76	.33	800		P6S8N-33		CU3W333		PT6033	6TM-P33	Note 3
C77	.1	600	110743	P6S8N-.1	DF-104	CUB6P1		PT601	6TM-P1	
C78	.1	400	110734	P4S8N-.1	DF-104	CUB4P1		PT401	4TM-P1	
C79	.047	400	110723	BPD-047	DF-503	CUB4S47		PT4147	4TM-S47	
C80	.047	400	110723	BPD-05	DF-503	CUB4S47		PT6147	6TM-S47	
C81	.001	400	110534	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C82	.001	400	110534	BPD-001	D6-102	CUB6D1	GP2L-102	PT621	6TM-D1	
C83	.0047	400	110716	BPD-0047	D6-472	CUB6D47	GP3-333-472	PT6247	6TM-D47	
C84	.047	400	110703	BPD-05	DF-503	CUB4S47		PT4147	4TM-S47	
C85	3900	500	110509	1464-0039		1R5D39		MC3463	M3-339	
C86	390	500	110263		D6-391	5R5T39	811-391	MC3243	M3-339	
C87	470	500	110283	1469-00047	D6-471	5R5T47	811-471	MC3545	M3-347	
C88	370	500	110260	BPD-00037	D6-371	5R5T37	811-371	UC-5327	M3-337	
C89	.01	600	110737	BPD-01	DF-103	CUB6S1	GP3-333-103	PT631	6TM-S1	
C90	.047	600	110741	BPD-05	DF-503	CUB6S47		PT6147	6TM-S47	
C91	220	500	110307	DI-00033	D6-221	5W5T22	811-331	MC340	1FM-S22	
C92	.1	400	110734	P4S8N-.1	DF-104	CUB4P1		PT401	4TM-P1	
C93	68	4000	110845	HVD-65-68	DD60-680					
C94	.068	1000	110573	P10S8N-068					10TM-S68	
C95	47			HVD-60-47	DD30-470	TP29	3KV-470	DC30447	50GA-Q47	
C96	.01	1000	110843	P10S8N-01	DD-103	CUB6S1		PT561	10TM-S1	
C97	.01	1000	110843	P10S8N-01	DD-103	CUB6S1		PT561	10TM-S1	

Note 1. Not used in some versions.
Note 2. In some versions C29 and C30 are combined in a dual 4000MMF unit. C30 is not used in some versions.
Note 3. Some versions use .047MFD in this application (part #10M-Q).
* Items C73A, C73B, C73C, R97A, R97B and R97C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	WATTS	Stromberg-Carlson PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	141191			QJ-856 *	UF55R	Tone (Panel)
B	250KΩ	½					UR254A ‡	Volume (Rear)
C	Shaft	½					US-26	Attach to R1B.
R2A	1Meg	½	141160	AB-98	A47-1Meg-8	QJ1-137	TA16L	Vertical Size
B	Shaft	½	Not Req.	AK-4	KS8-5	Not Req.	Not Req.	Attach to R2A.
R3A	500KΩ	½	141161	AX-51	A47-500K-S	QJ1-133	TA54L	Horizontal Hold
B	Shaft	½	Not Req.	AK-4	KS8-5	Not Req.	Not Req.	Attach to R3A.
R4A	2000Ω	½	141190			QJ7-111	UF23R ‡	Picture (Panel)
B	250KΩ	½				QJ1-130	UR254A ‡	Attach to R4A (Rear)
C	Shaft	½				Not Req.	DS-36	Attach to R4A. and R4B.
R5A	5Meg	½	141159	AB-97	A47-5.5Meg-8	QJ1-142	U-52	Vertical Size
B	Shaft	½	Not Req.	AK-1	FKS-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	5000Ω	½	141158	BX-10	A47-5000-S	QJ1-114	TA53L	Vertical Linearity
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R6A.
R7A	500KΩ	½	141153	BX-59	A47-500K-S	QJ1-123	TA55L	Brightness
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R7A.
R8A	400Ω	½	141163	BX-31	A47-400K-S	QJ1-125	TA54L	Horizontal Drive
B	Shaft	½	Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A.
R9A	500KΩ	½	141151			QJ-856 **	UF55L	Noise Cancel (Panel)
B	500KΩ	½				R2-40	UR55L	AGC (Rear)

* Universal Replacement (Mallory Exact Duplicate Part No. UE142SS).
† Universal Replacement (Mallory Exact Duplicate Part No. UE23S).
‡ Concentrikit Equivalent; K-7 Kit, Base Elements and Shafts; B11-133, P13-128 (Panel) B13-130, R2-212 (Rear) T6-1 (Switch)
** Concentrikit Equivalent; K-5 Kit, Base Elements and Shafts; B11-133, P9-021 (Panel) B11-133, R1-024 (Rear)

RESISTORS

ITEM No.	RATING OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	NOTES
R10	680KΩ	½			
R11	4700Ω	½		BTS-4700	
R12	560KΩ	½		BTS-560K	
R13	820KΩ	½		BTS-820K	
R14	10KΩ	½			
R15	3900Ω	½			
R16	2200Ω	½			
R17	10KΩ	½			
R18	47KΩ	½			
R19	10000Ω	½			
R20	1500Ω	2	149048	BTB-1500	
R21	1800Ω	2	149047	BTB-1800	
R22	2200Ω	2	149015	BTB-2200	
R23	1000Ω	2	149101	BTB-1000	
R24	3300Ω	2	28182	BTB-3300	
R25	2200Ω	2	149103	BTB-2200	
R26	470	2	28142	BTB-47	
R27	1000Ω	2	149101	BTB-1000	
R28	2700Ω	2	28163		
R29	2200Ω	2	149103	BTB-2200	
R30	15KΩ	2	28172		
R31	47Ω	2	28142	BTB-47	
R32	1000Ω	2	149101	BTB-1000	
R33	1500Ω	2	28160		
R34	22000Ω	2	149103	BTB-2200	

ITEM No.	RATING OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	NOTES
R35	47Ω	2	28142	BTB-47	
R36	6000Ω	10	149496	5W10-6000	
R37	15000Ω	2	28169		
R38	1000Ω	2	149101	BTS-1000	
R39	8200Ω	2	28169	BTS-8200	
R40	1000Ω	2	149101	BTS-1000	
R41	33Ω	2		BTS-330	
R42	47Ω2	2	28168	BTS-4700	
R43	2700Ω	2	28163	BTS-2700	
R44	1500Ω	2	149100	BTS-1500	
R45	68Ω	2	28145	BTS-68	
R46	560KΩ	2	28189	BTS-560K	
R47	680KΩ	2	28189	BTS-680K	
R48	330KΩ	2	149118	BTS-330K	
R49	120KΩ	2	28181	BTS-120K	
R50	220KΩ	2	28183	BTS-220K	
R51	680KΩ	2	149118	BTS-680K	
R52	22KΩ	2	149099	BTS-22K	
R53	1800Ω	2	149047	BTB-1800	
R54	2200Ω	2	149048	BTB-2200	
R55	2700Ω	2	28163	BTS-2700	
R56	470Ω	2	149099	BTS-470	
R57	1Meg	2	149121	BTS-1Meg	
R58	270KΩ	2	28184	BTS-270K	
R59	270KΩ	2	28184	BTS-270K	

RESISTORS (cont)

ITEM No.	RATING OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	NOTES
R60	22KΩ	½	149109	BTS-22K	
R61	15KΩ	½	149108	BTS-15K	
R62	3.3Meg	½	149122	BTS-3.3Meg	
R63	3900Ω	½	149183	BTA-3900	
R64	2200Ω	½	149103	BTS-2200	
R65	270KΩ	½	28184	BTS-270K	
R66	56KΩ	½	149112	BTS-56K	
R67	27KΩ	½	149403	BTA-27K	
R68	100KΩ	½	149113	BTS-100K	
R69	330KΩ	½	149116	BTS-330K	Note 1
R70	330KΩ	½	149116	BTS-330K	
R71	10KΩ	½	149107	BTS-10K	
R72	330Ω	½	28152	BTS-330	
R73	47KΩ	½	149111	BTS-47K	
R74	33KΩ	½	28175	BTS-33K	
R75	33KΩ	½	28175	BTS-33K	
R76	150Ω	½	149096	BTS-150	
R77	22KΩ	½	149109	BTS-22K	
R78	47KΩ	½	149111	BTS-47K	
R79	10Meg	½	149125	BTS-10Meg	
R80	470KΩ	½	149117	BTS-470K	
R81	470KΩ	½	149117	BTS-470K	
R82	750Ω	4	149497	PW4-750	
R83	68Ω	2	149094	BTS-68	
R84	150Ω	2	149133	BTA-150	
R85	270Ω	1	149135	BTA-470	Note 2
R86	100KΩ	2	149113	BTS-100K	
R87	33KΩ	2	28175	BTS-33K	
R88	330KΩ	2	28186	BTS-330K	
R89	15KΩ	2	149145	BTA-15K	
R90	12KΩ	2	149111	BTS-12K	
R91	1.5Meg	2	149120	BTS-1.5Meg	
R92	120KΩ	2	28181	BTS-120K	Note 1
R93	1Meg	2	149119	BTS-1Meg	Note 1
R94	2.2Meg	2	149121	BTS-2.2Meg	
R95	100KΩ	1	149113	BTS-100K	
R96	3900Ω	1	149182	BTA-3900	

ITEM No.	RATING OHMS	WATT	Stromberg-Carlson PART No.	IRC PART No.	NOTES
R97A	220KΩ	½			
B	2 Meg	½	149123	+ 128200	BTS-2200
C	82000Ω	½			BTS-8200
R98	330KΩ	2	28190		BTS-330K
R99	8200Ω	2	28189		BTS-8200
R100	1Meg	½	149119		BTS-1Meg
R101	220KΩ	½	149115		BTS-220K
R102	2Meg	½	149119		BTS-2Meg
R103	10KΩ	½	149107		BTS-10K
R104	2.2Meg	½	149119		BTS-2.2Meg
R105	4500Ω	8	149498		8W-4500
R106	47KΩ	½	149138		BTA-470
R107	560Ω	½			
R108	1500Ω	½			
R109	100KΩ	½	149385		BTS-100K
R110	100KΩ	½	149385		BTS-100K
R111	470KΩ	½	149117		149117
R112	4.7Meg	½	149123		149123
R113	680KΩ	½	149114		28189
R114	33Ω	½	149131		149131
R115	5600Ω	½	149194		149194
R116	120Ω	½	149127		28181
R117	6800Ω	½	28168		28168
R118	150Ω	½	28160		28160
R119	47KΩ	½	28177		28177
R120	470KΩ	½	149117		BTS-470K
R121	68Ω	½	149094		149094
R122	68Ω	½	149094		149094
R123	6800Ω	2	149053		149053
R124	5300Ω	2	149094		149094
R125	100Ω	2	149070		149070
R126	750Ω	4	149497		PW4-750
R127	1000Ω	2			BTS-1000
R128	4700Ω	2	149080		BTS-4700
R129	4700Ω	2	149080		BTS-4700
R130	100KΩ	2	149113		BTS-100K

Note 1. Not used in some versions.
Note 2. Some versions use a 330Ω 1W resistor in this application.
Note 3. Series X22 uses a 45000 4W resistor in this application.
* Items C73A, C73B, C73C, R97A, R97B, R97C are combined in one unit.

TRANSFORMER (POWER)

ITEM No.	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	111VAC 590VCT 5VAC 2.5A ADC	6.3VAC @ 0.5A	181449	P-9793	P-8264 ③	P-8184	26R33 ③	H-51BC ① ②

① Drill new mounting holes.
② Parallel and phase 6.3V ③ 5A windings for secondary #3, tape 6.3V ③ 1.2A winding.
③ Use high voltage taps on secondary #1, tape other taps. Parallel and phase 5.3V ③ 5A windings, tape 5V ③ 3A winding.
④ Tape 5.3 ③ 1.2A winding.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Vert. Osc. Trans.	181271	H6702	A-3003	209T1 ①	V405	A-8125	28A05	A-97X
T3	Vert. Output Trans.	181282-1	F9411 *	HVO-9 *	230T1 *	SX-03 *②	A-8265 *	FLY-24 *	Q-24 *
T4	Vert. Output Trans.	181269	J1804	A-3037	232T1	V313	A-8123	28S52	A-102X
T5A	Yoke Horiz. (23MEM)	114772	DF605 ②	MDF-75 ②	222D1 ③	DY-15A ③	T170F20A3 ③ ④	Y-10 ③ ④	T-19-1 ③ ④
B	Vert. (26.5MM)		② ③	② ③		③ ④	③ ④		
T6	Width Coil	114146	RF800 ②	MWC-5	213R1	201R15	WC-8	WC-22	WC-13

① Drill new mounting hole(s).
② Connect horizontal damping network across terminals #3 and #7, use original horizontal damping network if necessary.
③ Use original yoke rear cover and centering device.
④ Remove damping network from terminals #1 and #2, and #3 and #7, use original damping network.
⑤ Remove damping capacitor from terminals #1 and #2, connect to terminals #3 and #7, use original horizontal damping network, if necessary.
⑥ Use original horizontal damping network, if necessary.
⑦ Connect to terminals #3 and #4.
⑧ Enlarge mounting hole.
⑨ Connect to coded red and blue terminals.
* Available on special order only.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	RCA Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
4	9	9	9	4	9	9	9
3	8	8	8	3	8	8	Jumper 7 & 8
2	3	3	3	2	3	3	3
1	1	1	1	1	1	1	1
Convert Width Coil Across	1 & 2	1 & 3	1 & 3	1 & 2	1 & 3	1 & 3	1 & 3

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE	Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
	PRI. SEC.							
T7	5.2KΩ 8Ω	181283	21003	A-3902	A-3952	24S61	S-53X	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V C. IMP	Stromberg-Carlson PART No.	QUAM PART No.	RCA TYPE No.	NOTES
SP1	4"x 6"	PM	3.1Ω	155911	46A07	24S83	
SP2	6"x 9"	PM	3.2Ω	155853	69A2	23S81	

STROMBERG-CARLSON MODELS XP21, 22 Series, X21, 22 Series

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Stromberg-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Matching Trans.	0Ω	0Ω					
L2	Ant. Matching Trans.	0Ω	0Ω					
L3	IF Trap	0Ω						
L4	Trap Coil	0Ω						
L5	Ant., RF, Mixer Grid, Osc. Coils	0Ω						
L6	Neut. Coil	0Ω						
L7	RF Coil	0Ω						
L8	Conv. Plate	.2Ω	0Ω					
L9	1st Video IF	.3Ω		1 14470				Includes 39.75MC Trap
L10	2nd Video IF	.1Ω	.1Ω	114471	17-5002	TV-127	6232	Includes 41.25MC Trap
L11	Fil. Choke	0Ω		114145	19-1001		4604	1.7 Microhenries
L12	3rd Video IF	.1Ω	.1Ω	114472	17-5003	TV-128	6233	Includes 47.25MC Trap
L13	4th Video IF	.1Ω	.1Ω	114473	17-5004	TV-125	6234	
L14	Cathode Trap	0Ω	0Ω	114426	20-1045			
L15	Series Peaking Coil	12Ω		114776	19-3250	TV-185	6130	270 Microhenries
L16	Shunt Peaking Coil	6.5Ω		114745	19-3100	TV-181	6177	100 Microhenries
L17	Series Peaking Coil	12Ω		114787	19-3250	TV-185	6181	250 Microhenries
L18	Shunt Peaking Coil	8.2Ω		114774	19-3125		6120	140 Microhenries
L19	Series Peaking Coil			114787	19-3180 *	TV-184 *	6180 *	179 Microhenries, Wound on 5.6KΩ resistor - Note 1
L20	4.5MC Trap	2.5Ω		114417	20-1004	TV-151	1469	
L21	Shunt Peaking Coil	9.5Ω		114780	19-3180	TV-184	6180	179 Microhenries
L22	1st Sound IF	4.3Ω		114419	20-1004 ■	TV-151 ■	1470	
L23	2nd Sound IF	4.3Ω		114419	20-1004 ■	TV-151 ■	1470	
L24	Ratio Det.	5.5Ω	.7ΩCT	114418	17-3497	TV-115	6205	Tertiary Winding =.8Ω
L25	RF Choke	1.8Ω		114693	19-1002		4606	2.2 Microhenries, IRC Part No. CLA

Note 1. Not used in some versions.
* Parallel with 5.6KΩ resistor.
■ Remove capacitor across coil.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Stromberg-Carlson PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L26	110Ω		114132	19-1576	TV-163	6210			HS-5	

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: Stromberg-Carlson PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L27	.230ADC	64Ω	1.5HY	161051	C5037 ①	C-2996 ①	C-2326 ①	26C44 ①	C-17X ①

① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: Stromberg-Carlson PART No. FUSE	Stromberg-Carlson PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	1/4A 250V	128003		312.250 (3AG 1/4A)	357001	AGC 1/4	4405

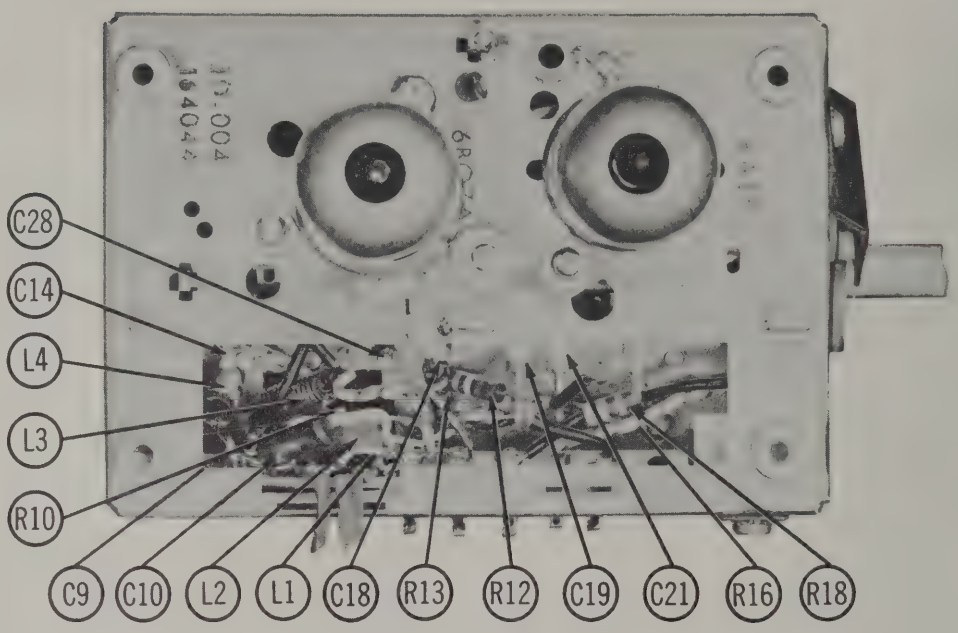
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA: Stromberg-Carlson PART No.	REPLACEMENT DATA: SYLVANIA PART No.	NOTES
M2	1N64 *	162202	1N60 or 1N132	Video Det.

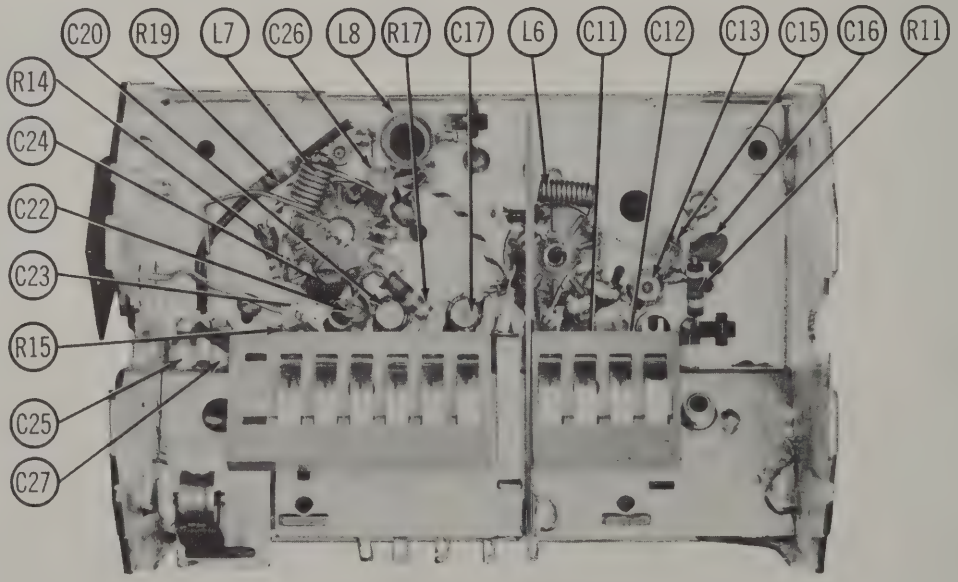
* Some versions may use 1N105 crystal diode in this application.

MISCELLANEOUS

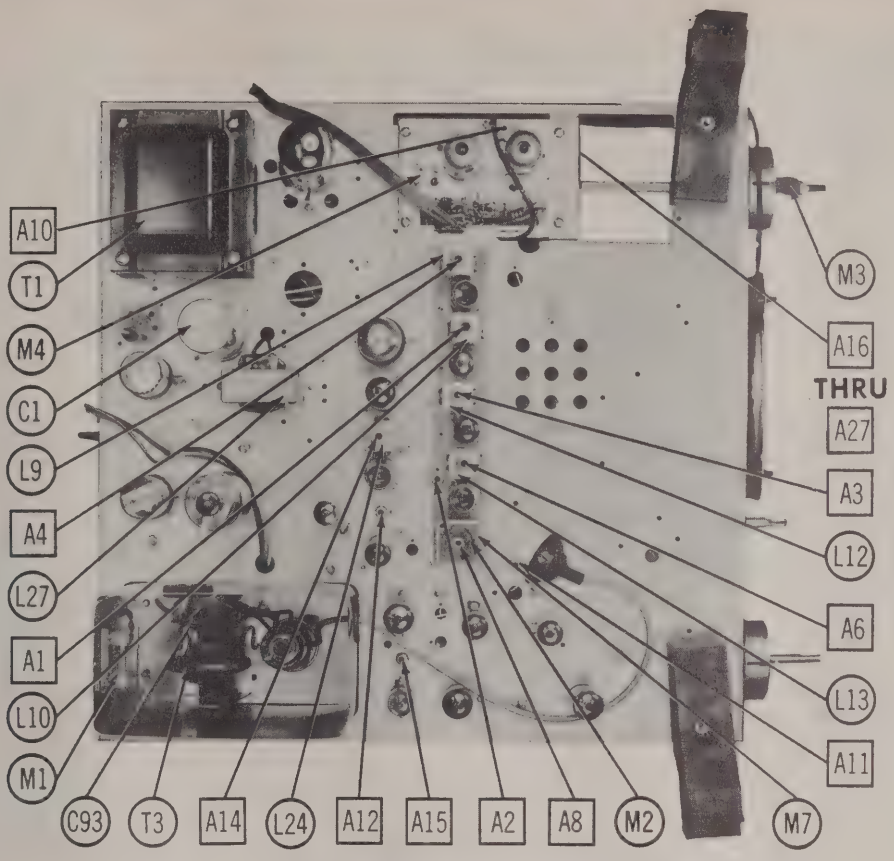
ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M3	Dial Light	137010	#46
M4	Tuner	164044	VHF-Series X21, XP21
	Tuner	171859	VHF-Series X22, XP22
M5	Tuner	171860	UHF-Series X22, XP22
M6	Trap		VHF Ant. Input Filter-Series X22, XP22
M7	Video Det. Assy.	114474	Includes M2 & Coils
M8	Switch	158037	TV-Phono (DPDT Slide Type)
M9	Centering Device		Part of Deflection Yoke (T5) Rear Cover
M10	Ion Trap	114778	
	Safety Glass	138044	Teleglass-Series X21, X22
	Safety Glass	138045	Teleglass-Series XP21, XP22
	Safety Glass	138047	Clear-Series X21, X22
	Safety Glass	138050	Clear-Series XP21, XP22
	Mask	174056	Mahogany-Series X21, X22
	Mask	174058	Mahogany-Series XP21, XP22
	Mask	174056	Blonde-Series X21, X22
	Mask	174064	Blonde-Series XP21, XP22
	Mask	174069	Red-Series X21, X22
	Mask	174071	Red-Series XP21, XP22



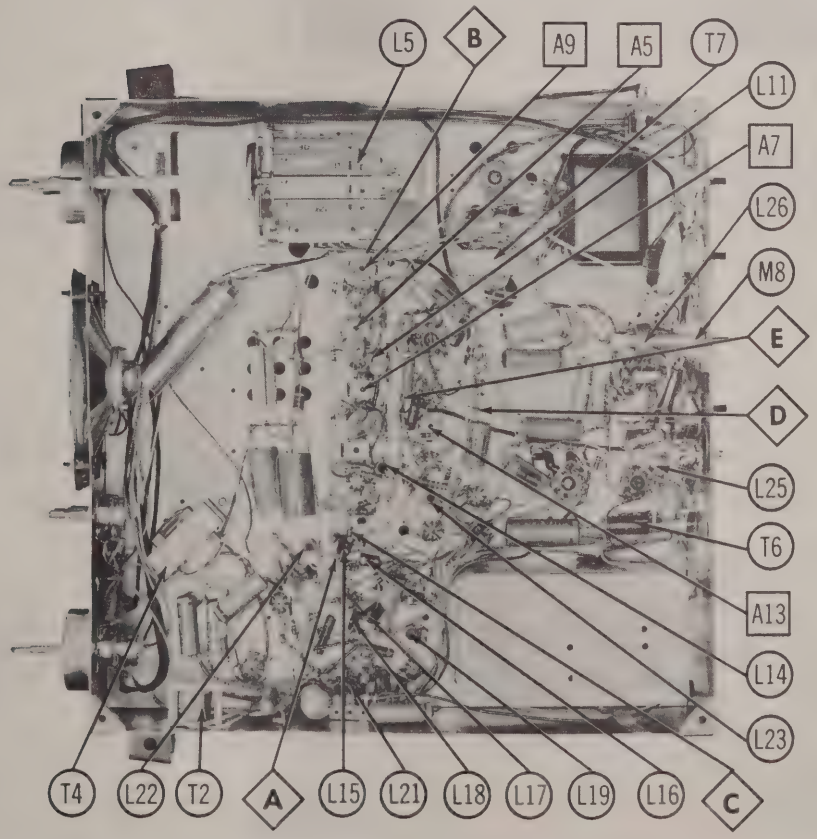
RF TUNER-TOP VIEW



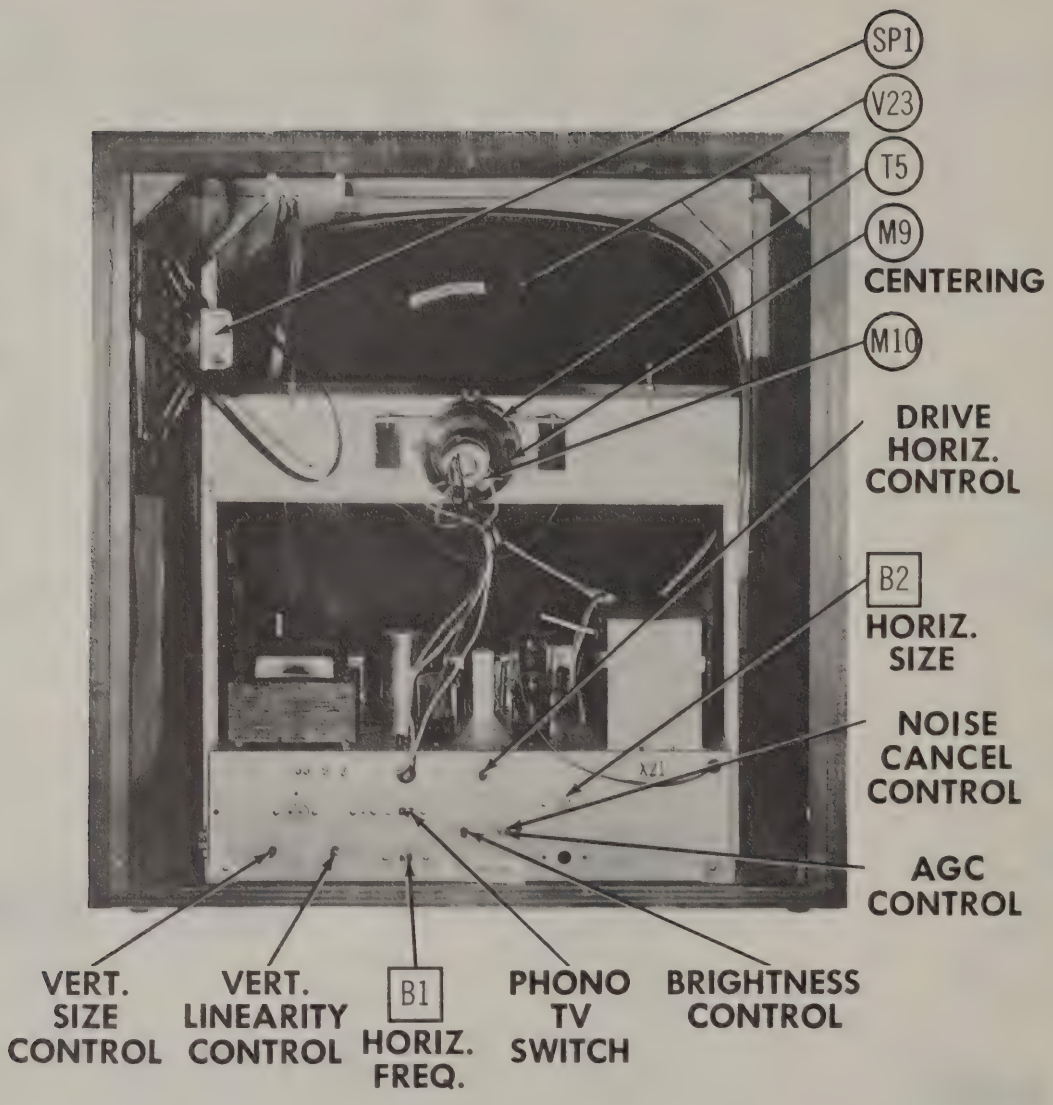
RF TUNER-BOTTOM VIEW



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern. Set the horizontal hold control to its mid-range position and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive control, located on rear panel for best compromise between brightness and horizontal linearity without a vertical white line or compression near the center of the screen.

Adjust the horizontal size slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

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ZENITH MODEL X2359E

TRADE NAME	Zenith	MODELS	CHASSIS
		X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU	22X20, U
		X2365EQ, EQU, RQ, RQU	22X20Q, U
		X2383, U, R, RU	22X20/1T01, U
		X2391EQ, EQU	22X20Q/12X20, U
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Illinois		
TYPE SET	Television Receiver		
TUBES	Twenty-two		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING 2.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 1
Horizontal Sweep Circuit Adjustments 18
Parts List and Descriptions 12, 13, 14
Photographs
- Cabinet-Rear View 18
- Capacitor Identification 3, 10
- Chassis-Top View 15
- RF Tuner 17
- Resistor Identification 4, 9

Photographs (Cont)
- Trans., Inductor & Alignment Identification 15

Resistance Measurements 8
Servicing in the Field 1
Schematic (Alternate Tuner) 11
Schematic (Phono Preamplifier) 7
Schematic (Remote Control Unit) 16
Schematic (TV) 2
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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*TRADE MARK
RETMA MEMBER

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

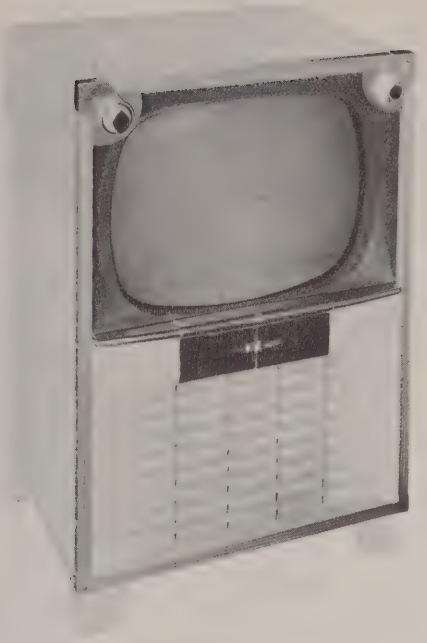
1. Remove channel selector knob from front panel of cabinet.
2. Remove 6 push-on type control knobs from under front control door.
3. Remove 9 wood screws and 1 metal screw. Remove rear cover.
4. Disconnect 2 tuner cables and volume control plug.
5. Remove 2 metal screws from top rear of cabinet (holding tuner to cabinet) lower rear of tuner and pull out.
6. Disconnect speaker leads.
7. Remove 4 chassis bolts. Remove chassis.

VOLUME CONTROL ASSEMBLY REMOVAL

1. Remove off/on volume control knob.
2. Remove 1 metal screw from metal trim. Remove trim.
3. Remove 1 control nut (outside cabinet).
4. Remove control.

SPEAKER REMOVAL

1. Remove 6 speaker nuts. Remove 2 speakers.



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MODELS	CHASSIS
X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU	22X20, U
X2365EQ, EQU, RQ, RQU	22X20Q, U
X2383, U, R, RU	22X20/1T01, U
X2391EQ, EQU	22X20Q/12X20, U

ZENITH MODELS X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU, X2365EQ, EQU, HQ, HQU, X2383, R, RU, U, X2391EQ, EQU (Ch. 22X20, 22X20Q, 22X20U)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

For touch-up adjustment of the VHF tuner oscillator circuit, it is necessary to remove rear cover and supply power to set. Adjustments are made thru the hole marked "Bull's Eye Adjustment" and are accessible one at a time as the selector switch is turned to each channel. (Fine tuning control must be set to the center of its range before making adjustments). Use Zenith alignment wrench part #68-21 for adjustment.

PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass remove channel selector and off/on volume control knobs. Remove 2 metal screws from metal trim then remove 4 wood screws now accessible. Remove corner braces and let safety glass fall forward and lift out. Use extreme caution when removing safety glass.

SERVICE ADJUSTMENT LOCATION

See tube placement chart on page 5.

SPECIAL ADJUSTMENTS

A. Fringe Lock Adjustment
Turn the fringe lock control 1/4 turn from fully clockwise. Adjust the vertical and horizontal hold controls for picture synchronization and check stability by switching off channel and back again. If necessary, retouch fringe lock adjustment for maximum stability while testing as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator may be made from the front of the receiver. Adjust the horizontal hold control (L30) until picture synchronizes horizontally. If satisfactory results cannot be obtained see horizontal sweep circuit adjustment.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on the rear apron of the chassis for maximum volume and minimum buzz. If results are unsatisfactory, see alignment instructions.

FUSES

One fuse is used for horizontal sweep circuit protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the picture size so that the sides of the raster are visible, and position magnets so that all sides are straight lines and the corners are at right angles.

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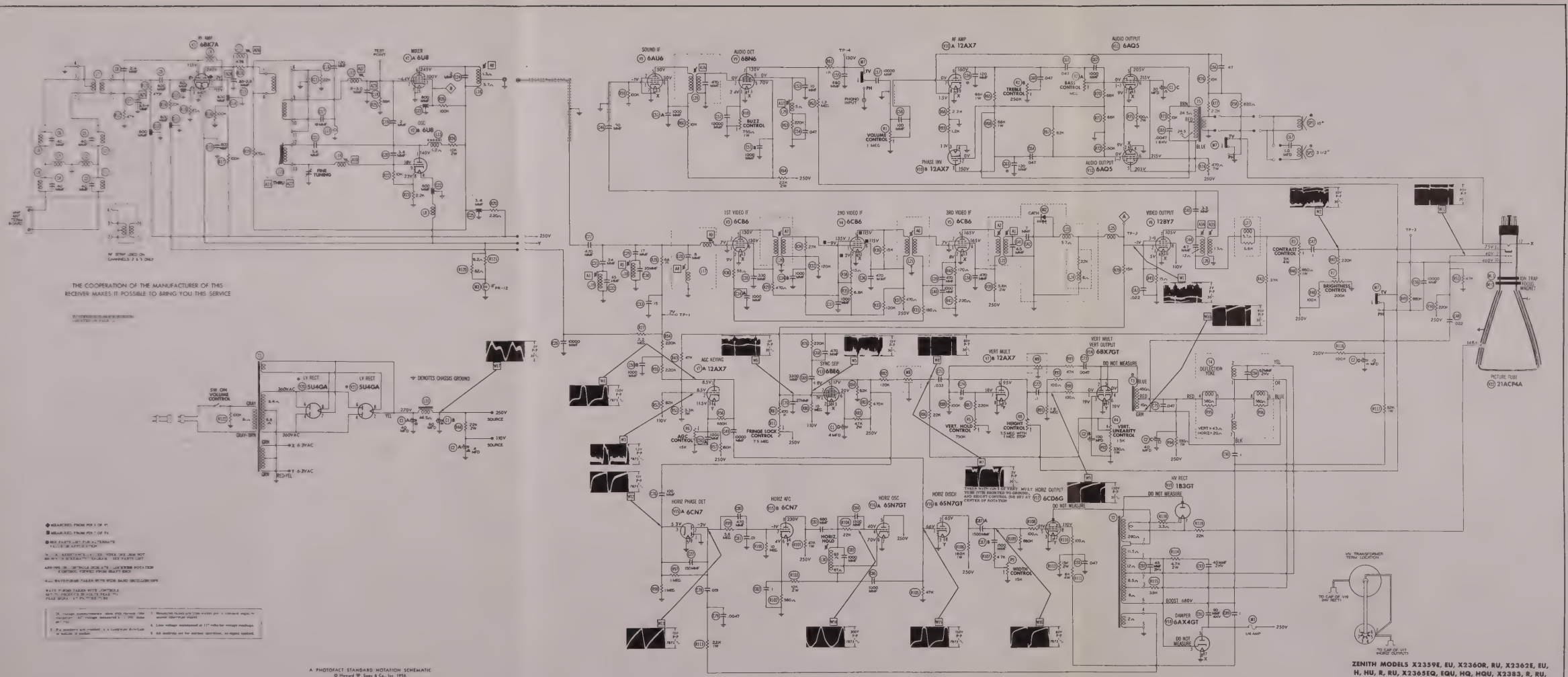
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
ZENITH MODELS X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU, X2365EQ, EQU, HQ, HQU, X2383, R, RU, U, X2391EQ, EQU (Ch. 22X20, 22X20Q, 22X20U)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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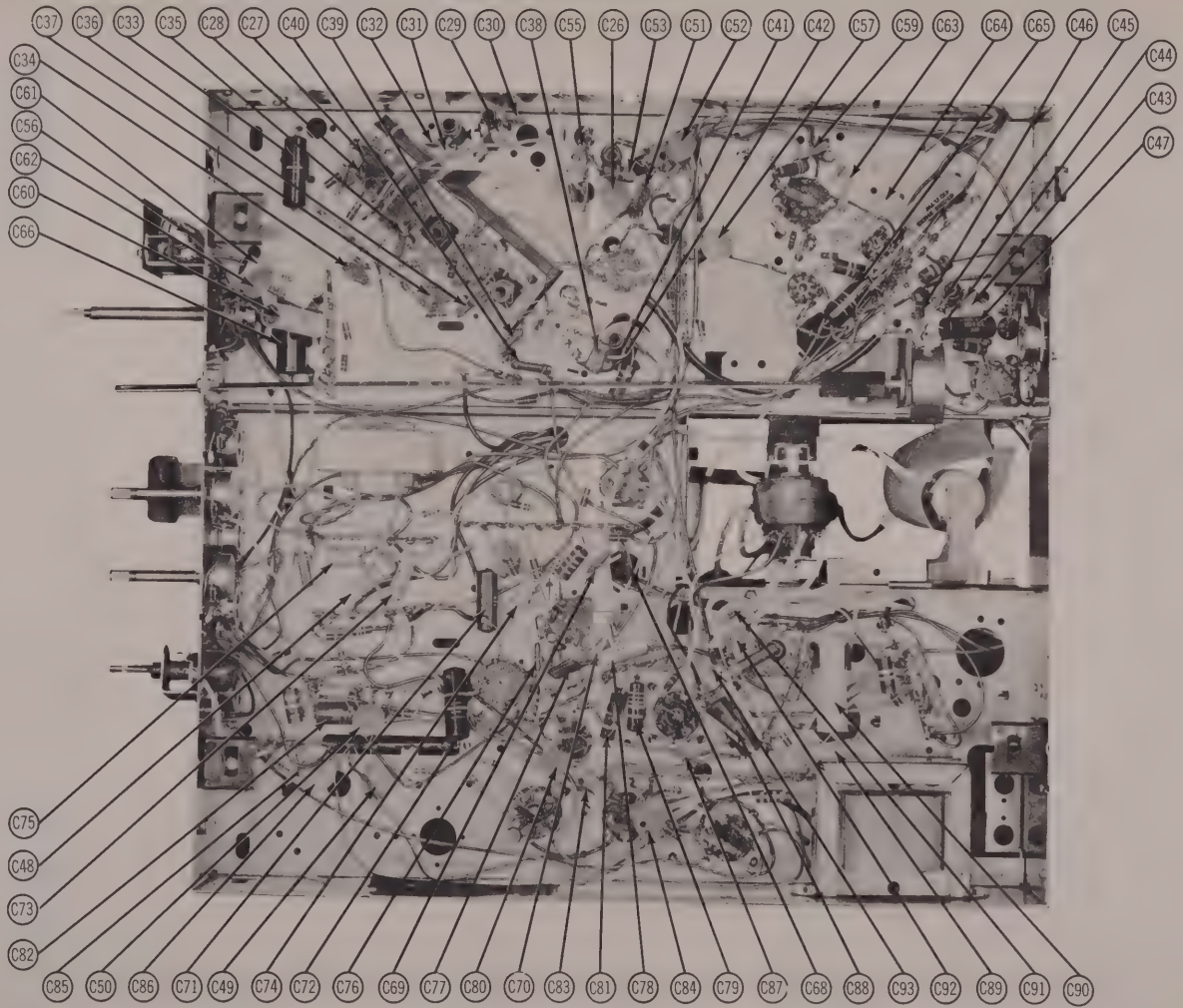
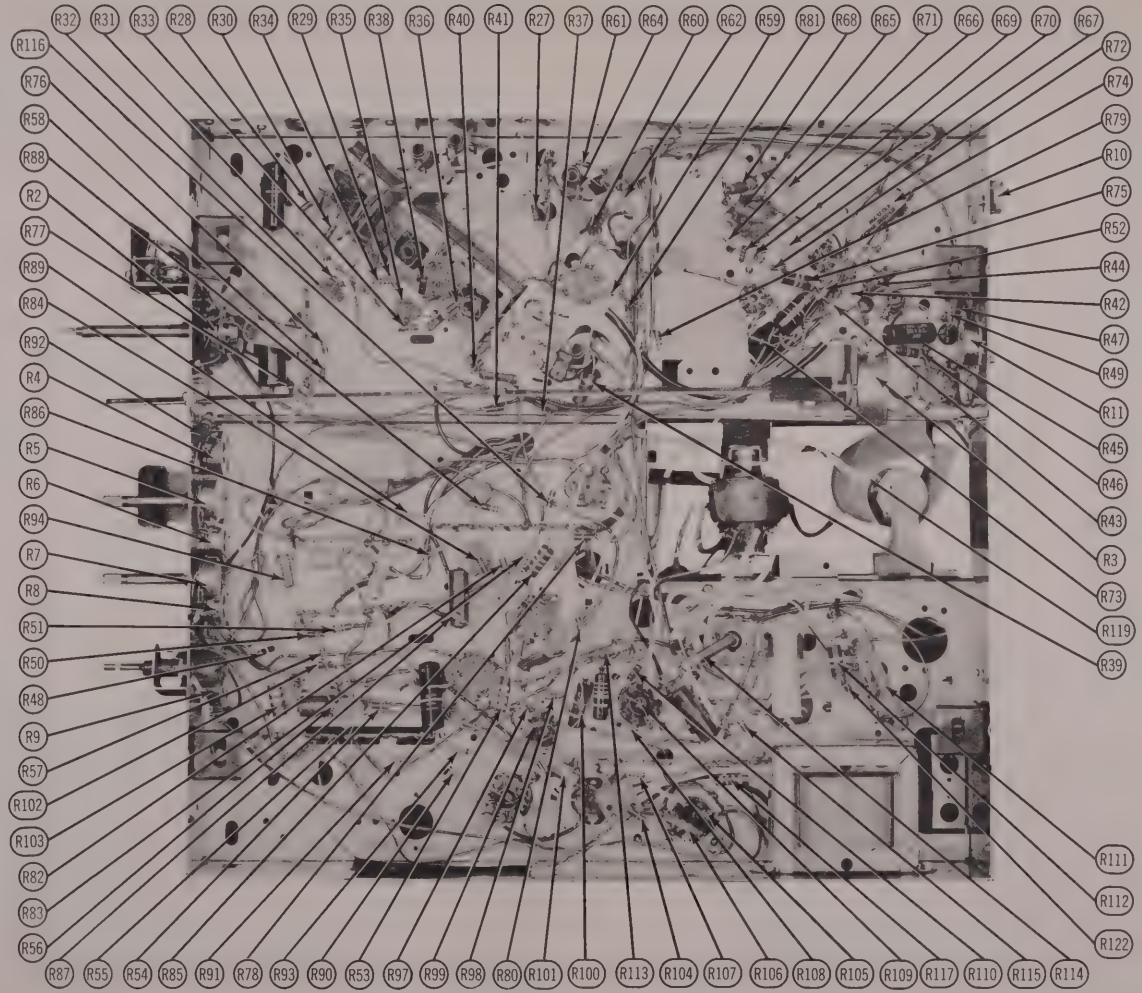


CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

ZENITH MODELS X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU, X2365EQ, EQU, HQ, HQU, X2383, R, RU, U, X2391EQ, EQU (Ch. 22X20, 22X20Q, 22X20U)



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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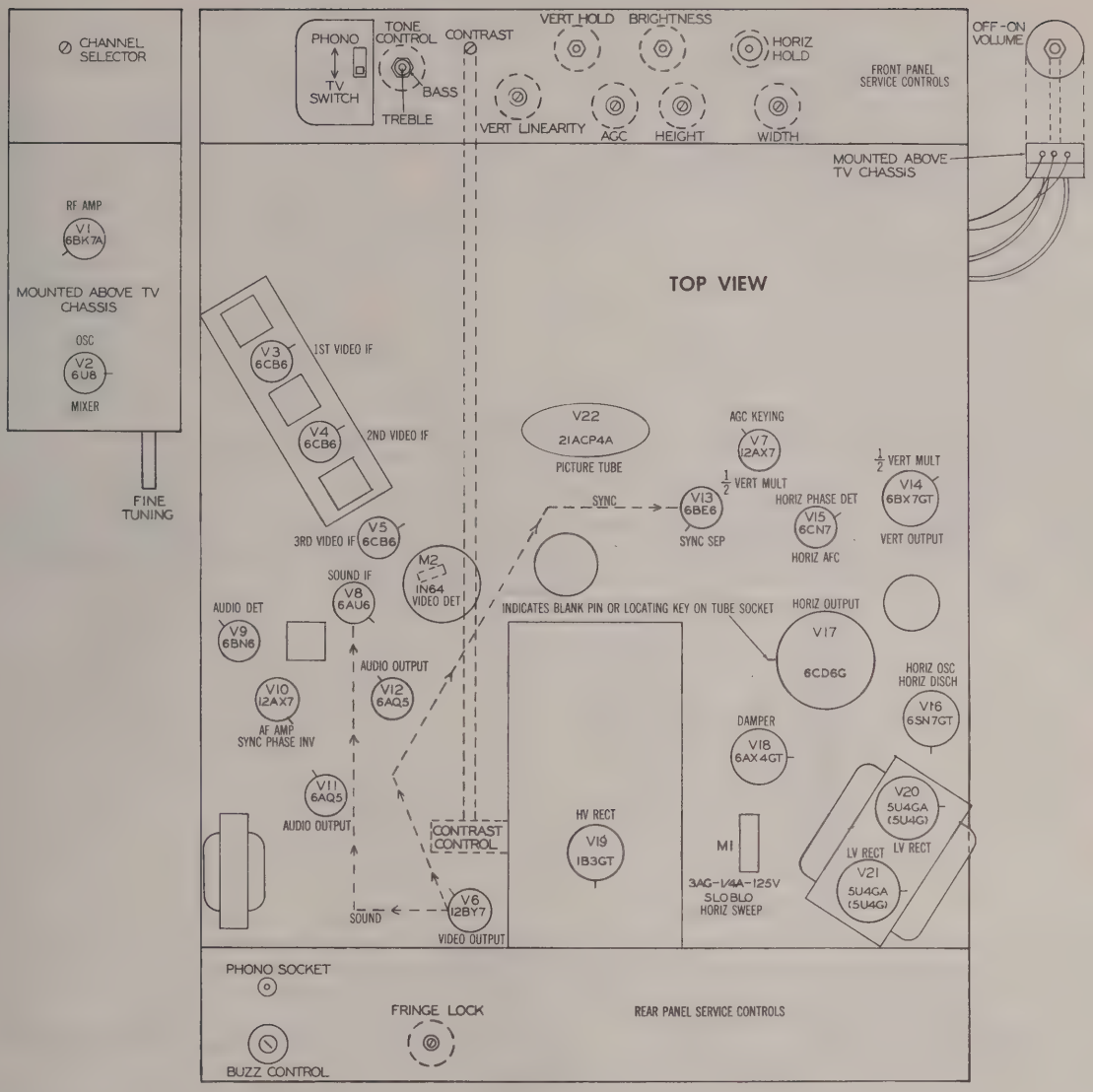
TUBE PLACEMENT CHART



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V20, V21**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V2, V3, V4, V5, V6**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V7, V22**
Has pic, no sound - **V8, V9, V10, V11, V12**
Overloaded picture - **V7**

SYNC FAILURE
No vert. sync - **V7, V13, V14**
No horiz. sync - **V13, V15, V16**
No vert. or horiz. sync - **V13**

SWEEP FAILURE
No raster, has sound - **V16, V17, V18, V19, V23, Fuse (M1)**
No vertical deflection - **V7, V14**
Poor vert. linearity or foldover - **V7, V14**
Poor horiz. linearity or foldover - **V16, V17, V18**
Narrow picture - **V16, V17, V18, V19, V20, V21**
Vert. off freq. - **V7, V13, V14**
Horiz. off freq. - **V13, V15, V16**

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the set is to be aligned with the picture tube removed, the high voltage lead should be securely taped away from the chassis.

VIDEO IF ALIGNMENT

Place the tuner turret mid-way between two channels.
Connect the negative lead of a 2 volt bias supply to the ungrounded side of C33. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMF	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	44MC (10MC Swp.)	39.75MC 45.75MC	See Note above.	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A1, A2	Adjust for response curve similar to Fig. 1. If correct response cannot be obtained, check to see that the slugs are entering the coils from the outside ends of the coils.
2.	"	High side to point (B). Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3, A4, A5	Reduce bias to zero. Turn sweep generator output to maximum. Increase gain on scope to magnify trap portions of response curve. Adjust traps for response similar to Fig. 2.
3.	"	"	"	42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8, A9	Replace 2 volt bias. Adjust for response curve similar to Fig. 3. Readjustment of A1 and A2 should not be required to obtain proper response.

OSCILLATOR ALIGNMENT

The master oscillator adjustment A10 is made only if the individual oscillator adjustments fail to bring all channels within the range of the fine tuning control. If channels 2 through 6 fall with-in the fine tuning range, but the high channels do not, slight adjustment of A10 may bring the high channels in.
Ground the AGC lead from the tuner (yellow lead) to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp.)	59.75MC	2	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A11	Adjust to place sound marker in trap notch as in Fig. 4.
			63MC (10MC Swp.)	65.75MC	3		A12	
			69MC (10MC Swp.)	71.75MC	4		A13	
			79MC (10MC Swp.)	81.75MC	5		A14	
			85MC (10MC Swp.)	87.75MC	6		A15	
			177MC (10MC Swp.)	179.75MC	7		A16	
			183MC (10MC Swp.)	185.75MC	8		A17	
			189MC (10MC Swp.)	191.75MC	9		A18	
			195MC (10MC Swp.)	197.75MC	10		A19	
			201MC (10MC Swp.)	203.75MC	11		A20	
			207MC (10MC Swp.)	209.75MC	12		A21	
			213MC (10MC Swp.)	217.75MC	13		A22	

VHF RF AND MIXER ALIGNMENT

Ground the AGC lead (yellow wire) from the tuner to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp.)	67.25MC 71.75MC	4	Vert. Amp. to point (B). Low side to chassis.	A23, A24, A25	Adjust for response curve similar to Fig. 5.
6.	"	"	201MC (10MC Swp.)	199.25MC 203.75MC	11	"	A26, A27	Adjust for response curve similar to Fig. 5. If bandpass is not correct, SLIGHTLY bend L12 (slotted tab in shield plate). Repeat steps 5 and 6 for optimum results on all channels.

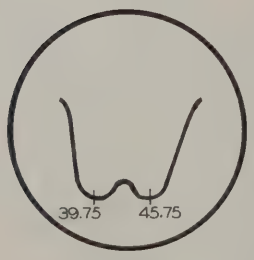


FIG. 1

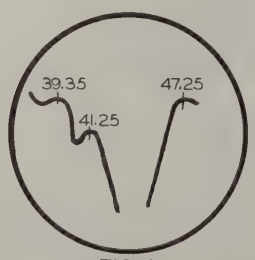


FIG. 2

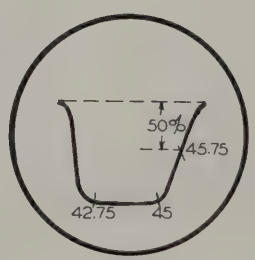


FIG. 3

ALIGNMENT INSTRUCTIONS (cont)

UHF TUNER ALIGNMENT

Any attempt to peak any one particular channel will usually cause serious degradation of the other channels. No attempt should be made to adjust the oscillator unless the calibration is off more than three channels. Turn the UHF tuning dial to channel 54. The rocker arm of the tuner should be horizontal. If it is not, loosen the set screw on the drive pulley and turn the tuner shaft independently of the pulley until the rocker arm is horizontal with the channel indicator at channel 54. Tighten the set screw. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω Carbon Resistors	Across UHF antenna terminals with 120Ω in each lead.	713MC (10MC Swp.)	711.25MC	54	Vert. Amp. thru 10KΩ to point (A). Low side to chassis.	A28, A29, A30	Adjust for response curve similar to Fig. 6. When adjusting A28, two responses may be found, the correct setting is with the adjustment at the most counter clockwise position.
8.	"	"	473MC (10MC Swp.)	471.25MC	14	"		Check for response similar to Fig. 6. If the oscillator is off calibration more than 3 channels, adjust the oscillator travel (osc. mixer and antenna travel adjustments are the round thumb screws on top of the tuner) adjustment to scale. Care must be exercised when making this adjustment not to move the rocker arm out of its bearing. Adjust the mixer and antenna travel adjustments for maximum amplitude response.
9.	"	"	887MC (10MC Swp.)	185.25MC	83	"	A31, A32, A33	Adjust A31 to place marker at 50% as in Fig. 6. Adjust A32 and A33 for maximum amplitude of response.

SOUND IF ALIGNMENT

Connect an attenuator (Zenith part no. S-17203 or equivalent) in series with the receiver antenna. Tune in a TV station and adjust the attenuator until the signal falls below the limiting level of the 6BN6 audio detector, as evidenced by hiss similar to super-regeneration. Adjust the sound take-off transformer (A34 and A35), the sound IF coil (A36) and the quadrature coil (A37) for maximum sound of best quality. Adjust the buzz control (R10) for minimum buzz. If the buzz cannot be eliminated with the buzz control, check the setting of the AGC control. If during any of the sound IF adjustments the signal rises above the limiting level (hiss disappears), increase the attenuation until the hiss returns.

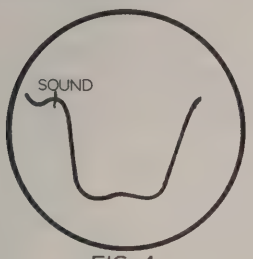


FIG. 4

FIG. 5

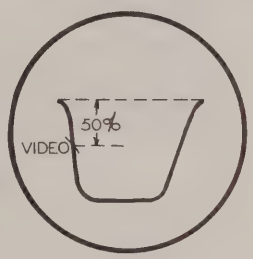
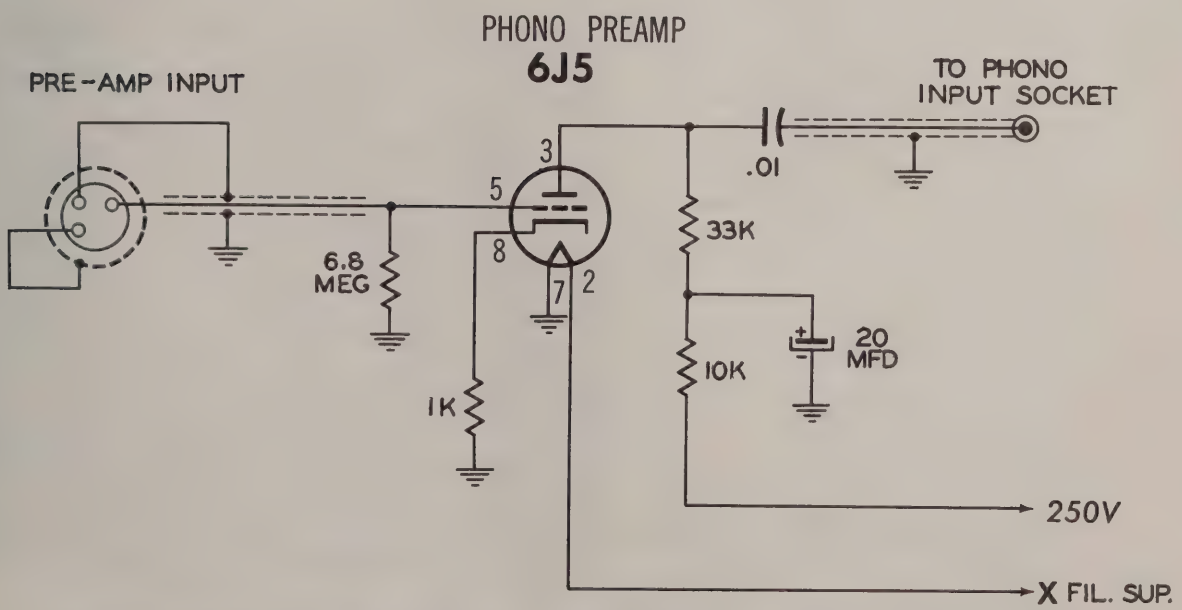


FIG. 6



PHONO PREAMP MODELS IT01 USED WITH MODELS X2383R, AND X2383RU

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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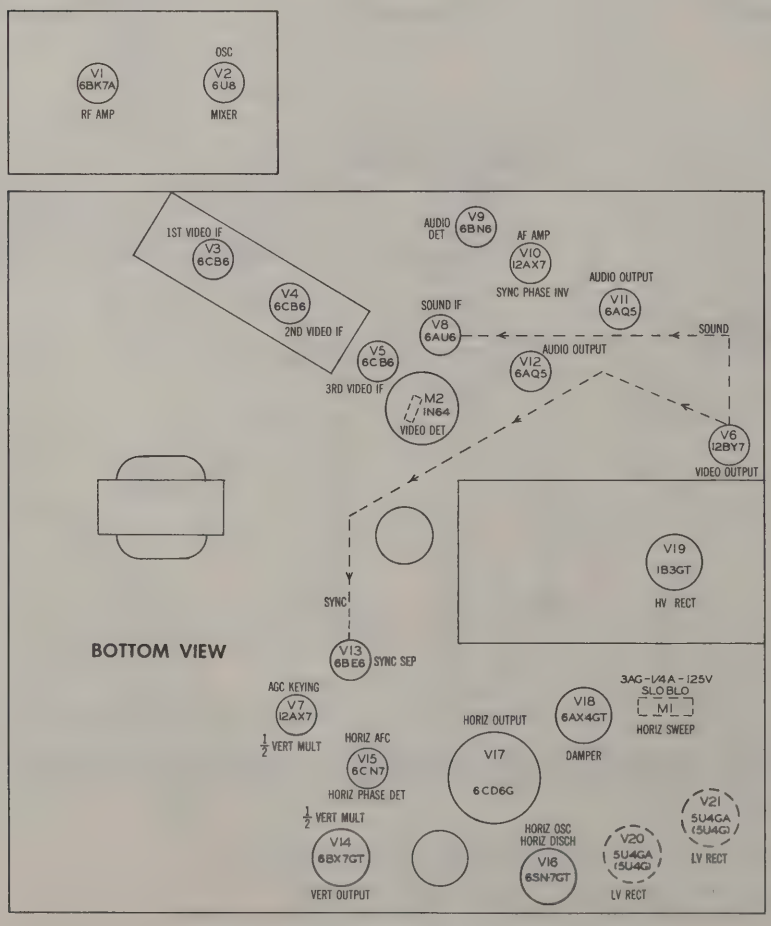
PHONO PRE-AMP CIRCUIT

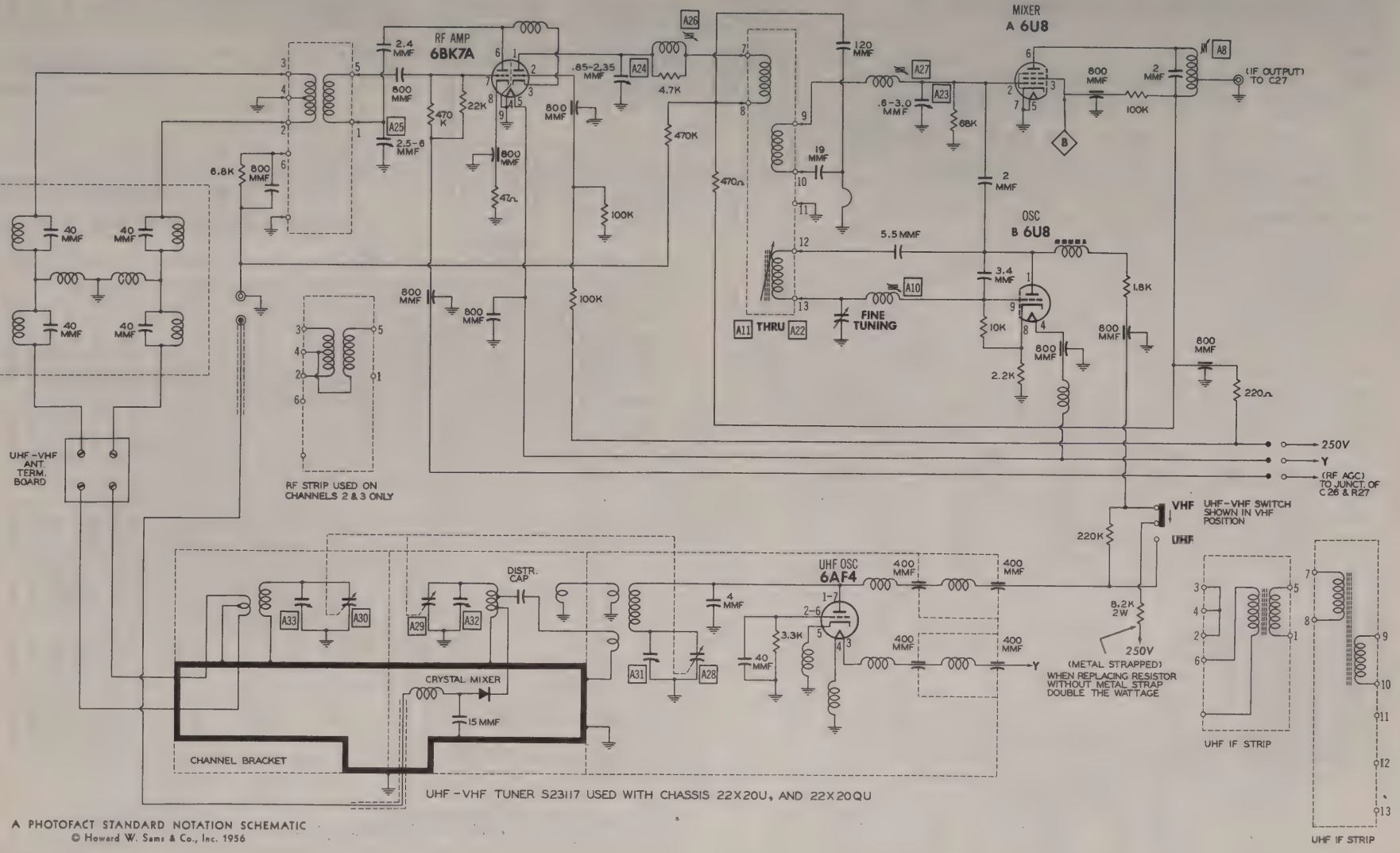
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7A	†700Ω	50KΩ	INF	0Ω	.1Ω	INF	3Meg	47Ω	0Ω
V 2	6U8	† 10KΩ	68KΩ	† 100KΩ	.1Ω	0Ω	† 270Ω	0Ω	2.2KΩ	12KΩ
V 3	6CB6	1Meg	450Ω	.1Ω	0Ω	▲ 470Ω	▲ 470Ω	0Ω		
V 4	6CB6	60KΩ	▲ 15Ω	.1Ω	0Ω	† 500Ω	† 500Ω	70KΩ		
V 5	6CB6	220Ω	34Ω	.1Ω	0Ω	† 5.6KΩ	† 5.6KΩ	0Ω		
V 6	12BY7	15Ω	2.7KΩ	15Ω	0Ω	0Ω	.1Ω	† 5.5KΩ	† 17KΩ	15Ω
V 7	12AX7	680KΩ	3.3KΩ	7.5KΩ	.1Ω	.1Ω	● 4.5Meg	500KΩ	0Ω	0Ω
V 8	6AU6	100KΩ	0Ω	.1Ω	0Ω	† 32KΩ	† 32KΩ	0Ω		
V 9	6BN6	400Ω	.4Ω	.1Ω	0Ω	† 22KΩ	220KΩ	● 1.2Meg		
V 10	12AX7	† 68KΩ	50KΩ	1.2KΩ	0Ω	0Ω	† 68KΩ	15KΩ	2.2KΩ	.1Ω
V 11	6AQ5	100KΩ	100Ω	.1Ω	0Ω	† 750Ω	† 500Ω	100KΩ		
V 12	6AQ5	70KΩ	100Ω	.1Ω	0Ω	† 750Ω	† 500Ω	70KΩ		
V 13	6BE6	17KΩ	0Ω	.1Ω	0Ω	† 60KΩ	† 47KΩ	10Meg		
V 14	6BX7GT	1.8Meg	† 800Ω	500Ω	1.8Meg	† 800Ω	500Ω	.1Ω	0Ω	
V 15	6CN7	0Ω	2Meg	1Meg	.1Ω	0Ω	560Ω	4Meg	† 47KΩ	.8Ω
V 16	6SN7GT	47KΩ	† 180KΩ	0Ω	32KΩ	† 46Ω	11KΩ	0Ω	.1Ω	
V 17	6CD6G	TP	.1Ω	0Ω	TP	680KΩ	NC	0Ω	† 6KΩ	TOP CAP ● 11.5Ω
V 18	6AX4GT	NC	NC	170KΩ	NC	† 50Ω	NC	.1Ω	0Ω	
V 19	1B3GT		PINS	1-8	HAVE	INF	RESISTANCE			TOP CAP ● 270Ω
V 20	5U4GA	INF	10KΩ	INF	8.8Ω	INF	9.4Ω	INF	10KΩ	
V 21	5U4GA	INF	10KΩ	INF	8.8Ω	INF	9.4Ω	INF	10KΩ	
V 22	21ACP4A	0Ω	† 50KΩ	PIN 10 ● 82KΩ	PIN 11 † 300KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 2 OF V21.
▲ MEASURED FROM PIN 7 OF V4.
● MEASURED FROM PIN 3 OF V18.
TP-TIE POINT.
NC-NO CONNECTION.



TUBE PLACEMENT CHART



UHF-VHF TUNER S23117 USED WITH CHASSIS 22X20U, AND 22X20QU

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ALTERNATE VHF-UHF TUNER SCHEMATIC

ZENITH MODELS X2359E, EU, X2360R, RU, X2362E, EU, H, HU, R, RU, X2365EQ, EQU, HQ, HQU, X2383, R, RU, U, X2391EQ, EQU (Ch. 22X20, 22X20Q, 22X20U)

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	NOTES
V1	RF Amplifier	6BK7A	6BK7A	
V2	Mixer-Oscillator	6U8	6U8	
V3	1st. Video IF Amplifier	6CB6	6CB6	
V4	2nd. Video IF Amplifier	6CB6	6CB6	
V5	3rd. Video IF Amplifier	6CB6	6CB6	
V6	Video Output	12BY7	12BY7	
V7	AGC Keying - Vert. Mult.	12AX7	12AX7	
V8	Sound IF Amplifier	6AU6	6AU6	
V9	Audio Detector	6BN6	6BN6	
V10	AF Amplifier-Sync Phase Inverter	12AX7	12AX7	
V11	Audio Output	6AQ5	6AQ5	
V12	Audio Output	6AQ5	6AQ5	
V13	Sync Separator	6BR6	6BR6	
V14	Vert Mult-Vert. Output	6BX7GT	6BX7GT	
V15	Horiz. AFC-Horiz. Phase Detector	6CN7	6CN7	
V16	Horiz Oscillator - Horiz Discharge	6N7GT	6N7GT	
V17	Horiz Output	6CD6G	6CD6G	
V18	Damper	6AX4GT	6AX4GT	
V19	HV Rectifier	1B3GT	1B3GT	
V20	LV Rectifier	5U4GA	5U4GA	5U4G may be used in some versions
V21	LV Rectifier	5U4GA	5U4GA	5U4G may be used in some versions

CATHODE-RAY TUBE

ITEM No.	ZENITH PART No.	REPLACEMENT DATA: CBS PART No.	REPLACEMENT DATA: GENERAL ELECTRIC PART No.	REPLACEMENT DATA: SYLVANIA PART No.	NOTES
V12	21ACP4A ①		21ACP4A ②	21ACP4A ②	① Aluminized ② Silver screen "85"
		21AMP4A①	21AMP4A ①	21AMP4A ②	
		21AMP4	21ACP4/21AMP4	21ACP4 21AMP4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: PYRAMID PART No.	REPLACEMENT DATA: SANGAMO PART No.	REPLACEMENT DATA: SPRAGUE PART No.
C1A	40	400	33-3507	RE-103G	DU5	FP378	TM-411	CT-180	R3095
B	30	400			BR635	TC80		FM-4504	
C	30	400							
D	4	350							
C2A	44	350	33-2479	AFH4-130-7S	D143	FP454.5	TM-4142	Q-467	TVL-4805
B	100	50						MT-05100	
C	40	400							
D	10	475							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C3	40		23-2511	NPO-D139	TC2-39	Z031	MPOL-390		5TCC-G39	
C4	40		23-2511	NPO-D139	TC2-39	Z031	MPOL-390		5TCC-G39	
C5	40		23-2511	NPO-D139	TC2-39	Z031	MPOL-390		5TCC-G39	
C6	40		23-2511	NPO-D139	TC2-39	Z031	MPOL-390		5TCC-G39	
C7	2.5-5		23-2221		828-8		533-10	CT553		
C8	2.4		23-2511							
C9	800		23-2551	BPD-0008	DD-801	G067	831-801	DC-831	9GA-T9	
C10	800		23-2577							
C11	800		23-2577							
C12	800		23-2577							
C13	800		23-2551	BPD-0008	DD-801	G067	831-801	DC-831	9GA-T9	
C14	800		23-2577							
C15	05-2.3		23-2453		828-3		525-GRT	CT565A		
C16	180		23-2591	NPO-D1130	TC2-130	G044	NPO-333-131		5TCC-T12	
C17	19		23-2406	NPO-S120	TC2-20	Z023	MPOK-200	ST-543	5TCC-Q20	
C18	6-3		23-2504		828-3		525-GRT	CT565A		
C19	3		23-2434	NPO-S12.3	TC2-2R3	Z005	NPOA-2R3		5TCCB-V23	
C20	3.4		23-2592							
C21	5.6		23-2499							
C22	800		23-2577							
C23	800		23-2577							
C24	3		23-2585							
C25	800		23-2577							
C26	10000		23-3	BPD-01	DD-103	K082	811-01	DC-811	5HK-S1	
C27	470		23-6	BPD-00047	DD-471	K060	831-471	UC-5347	9GA-T47	
C28	8		23-2461			Z015				
C29	17		23-2594							
C30	30		23-2550		TC2-30	Z028	NPOL-300			
C31	34		23-2515		TC2-34	Z025	NPOL-340			
C32	45		23-2600							
C33	15	300	23-2147	P288N-15		CUSEP15		PT40J5	2TM-P15	
C34A	1000			BPD-1X001	DD2-102	DK071	813-001	DCD-831	5HK-XD1	
B	1000									
C35	330		23-2309	S1330	D6-331	TP43	GP2K-331	UC-5333	9GA-T33	
C36	330		23-2302	S1470	D6-471	TP46	GP2K-471	UC-5347	9GA-T47	
C37	1000		23-217	BPD-001	DD-102	K069	801-001	DC-831	5HK-D1	
C38	470		23-2534	S1470	D6-471	TP46	GP2K-471	UC-5347	9GA-T47	
C39	470		23-2217	S1470	D6-471	TP46	GP2K-471	UC-5347	9GA-T47	
C40	1000		23-2112	S12000	D6-102	K069	801-001	UC-831	5HK-D1	
C41	4.5		23-2522							
C42	7		23-2575	NPO-D16.5	TC2-6R5	Z013	NPOA-6R5	ZT-5555	5TCCB-V65	
C43	.022	300	23-2071	BPD-03	DD-303	CUB4S23	817-03	PT4183	2TM-S23	
C44	47		23-2441							
C45	3.3		23-2343	NPO-S3.3	TC2-3R3	Z006	NPOA-3R3	ZT-5533	5TCCB-V33	
C46	50		23-2490	S150	D6-500	G234	GP2K-500	UC-545	9GA-Q5	
C47	.1	300	23-1777	P288N-1	DF-104	CUSEP1		PT401	2TM-P1	
C48	.022	400	23-2073	BPD-03	DD-303	CUB4S23	817-03	PT4183	4TM-S23	
C49	10000		23-3	BPD-01	DD-103	K083	811-01	DC-811	5HK-S1	
C50A	1000		23-21	BPD-2X001	DD2-102	DK071	812-001	DCD-831	5HK-XD1	
B	1000									
C51A	1000		23-21	BPD-2X001	DD2-102	DK071	813-001	DCD-831	5HK-XD1	
B	1000									
C52	10000		23-3	BPD-01	DD-103	K082	811-01	DC-811	5HK-S1	
C53	10		23-2378							
C54	.047	300	23-1778	BPD-05	DF-503	CUB2S47		PT4167	2TM-S47	
C55	680		23-2320	S1680	D6-681	TP50	GP2K-681	UC-5368	9GA-T68	

PARTS LIST AND DESCRIPTIONS

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: MALLORY PART No.	REPLACEMENT DATA: SPRAGUE PART No.	NOTES
C56	10000		23-3	BPD-01	DD-103	K083	811-01	DC-811	5HK-S1	
C57	10000		23-3	BPD-01	DD-103	K083	811-01	DC-811	5HK-S1	
C58	100		23-5	BPD-0001	DD-101	TP34	801-101	UC-831	9GA-T1	
C59	120	500		BPD-0012	D6-121	125ET12	GP2K-121	UC-5313	9GA-T13	Note 1
C60	.047	500	23-1844	BPD-03	DF-503	CUB6S47		PT6347	6TM-S47	
C61	.047	500	23-1844	BPD-03	DF-503	CUB6S47		PT6347	6TM-S47	
C62	1000		23-17	BPD-001	DD-102	K069	801-001	DC-831	5HK-D1	
C63	120	500		BPD-0012	D6-121	125ET12	GP2K-121	UC-5313	9GA-T13	Note 1
C64	.047	500	23-1844	BPD-03	DF-503	CUB6S47		PT6347	6TM-S47	
C65	.0047	1500	23-2599	HVD-15-0047	DD15-503	CUR6D47	1R5KV-473	PT6347	M6-D47	
C66	.47	200	23-1845	P288N-.47		CUB2P47		PT4047	2TM-P47	
C67	1.0	150	23-1623	P288N-1.0		CUB2W1		PT41	2TM-M1	
C68	470		23-6	BPD-0006	DD-471	K060	831-471	UC-5347	9GA-T47	
C69	3300		23-11	BPD-0033	DE-332	S077	81J-0033	UC-5333	9GA-D33	
C70	27		23-2459		S127	D6-270	G027	GP2K-270	UC-5327	9GA-Q27
C71	.033	400	23-2435				CUB6S3			
C72	.1	400	23-2091	P488N-1		DF-104	CUB4P1		PT401	4TM-P1
C73	.0047	600	23-1849	1484-0047			CUB6D47		MCB645	M6-347
C74	.01	200	23-2555				CUB4S1			
C75	.047	200	23-1778	BPD-03	DF-503		CUB2S47		PT4167	2TM-S47
C76	100		23-1442	NPO-S1D0	D6-101		TZ30	901-101	MCB235	M5-31
C77	150		23-1127	NPO-S1D0	D6-151		TZ34	911-151	MCB330	M6-315
C78	.001	200	23-1819	SD1000	D6-102		CUB6D1	GP2L-102	PT631	6TM-D1
C79	.0047	400	23-1843	1484-0047			1R5D47		MCB465	M6-347
C80	470		23-6	BPD-00047	DD-471		G060	831-471	UC-5347	9GA-T47
C81	.01	400	23-1809	BPD-01	DE-103		CUB4S1	GP3-333-103	PT611	4TM-S1
C82	.1	200	23-1777	P288N-.1	DF-104		CUB2P1		PT401	2TM-P1
C83	680		23-2125	1484-00068	D6-681		1R5T68	811-681		M6-368
C84	1500	500	23-2289	DI-0015	D6-152		1WSD15	811-152	MCB56	1FM-315
C85	1000		23-2183	1484-001			1R5D1	811-102	MCB165	M5-31
C86	1000		23-2598	DI-001	DD-102		K069	811-102	DC-831	5GA-D1
C87A	1500		23-23	BPD-2X0015	DD2-152		DK071	813-0015	DCD-5215	9HK-XD15
B	1500									
C88	.047	400	23-1775	BPD-05	DF-503		CUB4S47		PT4167	4TM-S47
C89	.1	400	23-2340	P488N-1	DF-104		CUB4P1		PT401	4TM-P1
C90	.1	600	23-1841	P883N-1	DF-104		CUB6P1		PT601	6TM-P1
C91	90	4000	23-2662							
C92	45	2000	23-2099							
C93	45	2000	23-2099							
C94	82					DD30-820			20GA-Q82	

Note 1. Some versions use 100MMF in this application (part #23-5).

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg		53-3229	B-70-E	A47-1Meg-2	Q13-157	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A.
C	Switch		Not Req.	Not Req.	SWE-12	T8-1	Not Req.	Attach to R1A.
R2A	1Meg		53-3578				UF18L	Base (Panel)
B	250KΩ						UR25A4	† Treble (Rear)
R3	5000Ω	4	53-3201					Contrast (Wire Wound)
R4A	150KΩ		53-3230	AB-6	A47-1500-S	Q11-109	TAP153L	Vert. Linearity
B	Shaft		Not Req.	AK-1	FKS-1/4	HQ	Not Req.	Attach to R4A.
R5A	750KΩ		53-3588	AB-66	A47-750K-S	Q11-136	U-54	Vert. Hold
B	Shaft		Not Req.	AK-4	FKS-1/4	Not Req.	Not Req.	Attach to R5A.
R6A	15KΩ		53-2978	AB-20	A47-15K-S	Q11-119	TA153L	AGC
B	Shaft		Not Req.	AK-1	FKS-1/4	HQ	Not Req.	Attach to R6A.
R7A	200KΩ		53-3589	AB-50	A47-200K-S	Q11-129	U-43	Brightness
B	Shaft		Not Req.	AK-4	KS6-3	Not Req.	Not Req.	Attach to R7A.
R8A	7.5Meg		53-3546	• AB-89	•A47-7.5Meg-S	• Q11-142	• U-83	Height
	with 1Meg stop.							
B	Shaft		Not Req.	AK-1	FKS-1/4	HQ	Not Req.	Attach to R8A.
R9A	15KΩ		53-3978	AB-20	A47-15K-S	Q11-119	Not Req.	Width
B	Shaft		Not Req.	AK-1	FKS-1/4	HQ	Not Req.	Attach to R9A.
R10	750Ω	1	53-3284		39-500			Buzz (Wire Wound)
R11A	7.5Meg		53-3919	AB-98	A47-7.5Meg-S	Q11-143	U-82	Fringe Lock
B	Shaft		Not Req.	AK-1	FKS-1/4	HQ	Not Req.	Attach to R11A.

• Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).

† Universal Replacement (Mallory Exact Duplicate Part No. 1R5T68).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R12	47KΩ		53-2350	BTS-47K	
R15	470KΩ		53-1704	BTS-470K	
R14	82KΩ		53-1758	BTS-82K	
R15	47Ω		53-1705	BTS-47	
R16	100KΩ		53-1706	BTS-100K	
R17	100KΩ		53-1707	BTS-100K	
R18	470KΩ		53-1708	BTS-470K	
R19	1MΩ		53-1709	BTS-1M	
R20	220Ω		53-1710	BTS-220	
R21	220KΩ		53-1711	BTS-220K	
R22	10KΩ		53-1712	BTS-10K	
R23	2200Ω		53-1713	BTS-2200	
R24	10KΩ		53-3170	BTS-10K	
R25	68KΩ			BTS-68K	
R26	100KΩ			BTS-100K	
R27	2.2Meg		53-1926	BTS-2.2Meg	
R28	68Ω		53-1737	BTS-68	
R29	470Ω		53-1772	BTS-470	
R30	56Ω		53-1733	BTS-56	
R31	180Ω		53-1734	BTS-180	
R32	130KΩ		53-1873	BTS-130K	
R33	130KΩ		53-1873	BTS-130K	
R34	27KΩ		53-1842	BTS-27K	
R35	680KΩ		53-1821	BTS-680K	
R36	15KΩ		53-1834		
R37	470Ω		53-1773	BTS-470	
R38	15Ω		53-1708	BTS-15	
R39	5600Ω		53-2323		
R40	120Ω		53-1747	BTS-120	
R41	2200 5%		53-1756	BTS-220 5%	
R42	33KΩ		53-1848	BTS-33K	
R43	47KΩ		53-1855	BTS-47K	
R44	220KΩ		53-1868	BTS-220K	
R45	15Ω		53-1708	BTS-15	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R46	68Ω		53-2350	BTA-68Ω	
R47	220KΩ		53-1894	BTS-220K	
R48	100KΩ		53-1870	BTS-100K	
R49	680KΩ		53-1904	BTS-680K	
R50	220KΩ		53-1853	BTS-220K	
R51	47KΩ		53-1855	BTS-47K	
R52	82KΩ		53-1866	BTS-82K	
R53	330Ω			BTS-330	
R54	220KΩ		53-1883	BTS-220K	
R55	220KΩ		53-1883	BTS-220K	
R56	680KΩ		53-1904	BTS-680K	
R57	180KΩ		53-1880	BTS-180K	
R58	68KΩ		53-1782	BTS-68K	
R59	100KΩ		53-1870	BTS-100K	
R60	10KΩ		53-1828	BTS-10K	
R61	100Ω		53-1788	BTS-100	
R62	1.2Meg			BTS-1.2Meg	
R63	220KΩ		53-1883	BTS-220K	
R64	22KΩ	2	53-2141	BTB-22K	
R65	68KΩ			BTA-68K	
R66	2200Ω		53-1799	BTS-2200	
R67	82KΩ		53-1866	BTS-82K	
R68	330KΩ			BTS-330K	
R69	1200Ω		53-1796	BTS-1200	
R70	68KΩ		53-1862	BTS-68K	
R71	68KΩ		53-1862	BTS-68K	
R72	150KΩ		53-1877	BTS-150K	
R73	10KΩ		53-1828	BTS-10K	
R74	470Ω	7	53-2356		
R75	100Ω	2	53-1973	BTB-100	
R76	10KΩ		53-1830	BTS-10K	
R77	2200Ω		53-1796	BTS-2200	
R78	220KΩ		53-1883	BTS-220K	
R79	15KΩ		53-1834	BTS-15K	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R80	10Meg		53-1953	BTS-10Meg	
R81	470KΩ		53-1897	BTS-470K	
R82	130KΩ		53-1873	BTS-130K	
R83	470KΩ		53-1897	BTS-470K	
R84	82KΩ		53-1866	BTS-82K	
R85	47KΩ		53-1187	BTS-47K	
R86	22KΩ		53-1842	BTS-22K	
R87	230KΩ		53-1883	BTS-230K	
R88	100KΩ		53-1870	BTS-100K	
R89	47KΩ		53-1858	BTS-47K	
R90	10MΩ		53-1744	BTS-10M	
R91	1.5Meg		53-1923	BTS-1.5Meg	
R92	33KΩ		53-2348	BTA-33K	
R93	10KΩ		53-1744	BTS-10K	
R94	33KΩ		53-2388	BTA-33K	
R95	56KΩ				
R96	5KΩ				
R97	1Meg		53-1951	BTS-1Meg	
R98	1Meg		53-1951	BTS-1Meg	
R99	6.5Meg		53-1945		
R100	10MΩ		53-1953		
R101	47KΩ	1	53-1184	BTA-47K	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R102	560Ω			BTS-560	
R103	10KΩ	2	53-2165	BTB-10K	
R104	22KΩ		53-1841		
R105	47KΩ		53-1855		
R106	180KΩ		53-2313		
R107	4700Ω		53-1813		
R108	10Ω		53-1744		
R109	680Ω		53-1904		
R110	10Ω		53-1744		
R111	6000Ω	4	53-2579	PWT-6000	
R112	15KΩ	5	53-1842		
R113	22KΩ		53-1998	BTA-22K	
R114	47000Ω	5	53-2566	BTA-4700	
R115	1800Ω		53-1810		
R116	100KΩ		53-1870	BTS-100K	
R117	82KΩ		53-1971	BTA-82K	
R118	3.3Ω		53-2789	BWH-3.3	
R119	22KΩ		53-1841		
R120	82Ω			BTS-82	
R121	8.2Ω(WW)				
R122	100K		53-1870	BTS-100K	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117VAC	530VCT	5V		12.6VCT	96-1400		P8353		
	@ 2.2A	@ .35DA	@ 6A		@ 6.4A					

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	RCA TYPE No.	Rem PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T2	Horiz.Output Trans.	S-23049 ①							
T3	Vert. Output Trans.	95-1431	Z1900 ③ ④	A-3681		V314	A-8148 ③	26W7 ③ ④	
		95-1397 ②							
T4A	Yoke(90°)Horiz.(13MH)	95-1448 ⑤	DF605 ③	MDY-21 ③	231D1 ③	Y90Y13/67	DY-13A ③	Y-14 ③ ④	Y-60-1 ③
B	Vert.(43MH)		④	⑤	④	④	⑤		④

1) Complete assembly includes: Winding and terminal assembly, Zenith Part No. S-23049, Tertiary winding and terminal assembly, Zenith Part No. S-21364.

② Alternate vertical output transformer.
③ Use 8 to 1 turns ratio.
④ Connect as auto transformer.
⑤ Cut and tape green lead.
⑥ Drill new mounting hole(s).
⑦ Includes capacitor C94, resistors R95, R96.
⑧ Use original horizontal yoke damping network, with capacitor across terminals #3 and #7.
⑨ Connect horizontal yoke terminal #3 to horizontal output transformer terminal #3, horizontal yoke terminals #2 and #7 to resistor R116, horizontal yoke terminal #1 to capacitor C90.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC	REPLACEMENT DATA: ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	8.8KΩ	3-4Ω	95-1398		21011	A2994	A3824	22856	S-53X

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: QUAM PART No.	RCA TYPE No.	NOTES
SP1	10"	PM	3-4Ω	49-766 ①	10A10X23.2		① Used in Models X3360R, X3369EU, X3360H, U, X3362E, H, R, U, X3365E, Q, EQ, U, X3362, R, U.
SP2	12"	PM	3-4Ω	49-778 ②	12A10X23.2		② Used in Model X3369EQ, U.
	5½"	PM	14Ω	49-782 ③	5AIST		③ Used in Models X3369E, X3369EU, X3360R, U, X3362E, H, R, U, X3369E, Q, EQ, U.
	5½"	PM	14Ω	49-777 ④	5AIST		④ Used in Models X3383, R, U, X3381EQ, U.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	IF Trap	0Ω		20-490				
L2	IF Trap	0Ω		20-505				
L3	FM Trap	0Ω		20-490				
L4	IF Trap	0Ω		20-490				
L5	IF Trap	0Ω		20-505				
L6	FM Trap	0Ω		20-490				
L7	Ant. Coils	0DCT	0Ω					
L8	Fil. Choke	0Ω		20-291				
L9	Neut. Coil	0Ω		20-431				
L10	RF, Mixer Grid, Osc.Coils	0Ω						
L11	RF Coil	0Ω		20-537				
L12	Mixer Grid Coil	0Ω		20-538				
L13	Mixer Grid Coil	0Ω		126-764				
L14	Osc. Coil	0Ω		20-541				
L15	RF Coil	1.2Ω		S-18859				
L16	Conv. Plate	7Ω		S-22702				Tapped @ 5.7Ω
L17	1st Video IF	1Ω		S-22303				Includes Cap. & 41.25MC Trap
L18	47.25MC Trap	0Ω		S-21718			6328	
L19	39.75MC Trap	0Ω		S-21719			6235	
L20	2nd Video IF	.1Ω	.1Ω	S-17907	17-5004 *	TV-125 *	6234 *	
L21	3rd Video IF	.1Ω	.1Ω	S-18923	17-5003 *	TV-125 *	6233 *	
L22	4th Video IF	.3Ω	.3Ω	S-20623				
L23	Series Peaking Coil	5.7Ω		S-17912	19-3089	TV-181	6177	100 Microhenries
L24	Shunt Peaking Coil	6Ω		S-21562	19-3180 ▲	TV-184 ▲	4844 ▲	180 Microhenries, Wound in series on 2.7KΩ resistor
L25	Series Peaking Coil	.9Ω		S-21888	19-1004		4630	6.7 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L26A B	4.5MC Trap 1st Sound IF	12Ω 1.3Ω		S-21492				
L27	Series Peaking Coil	5.7Ω		S-21563	19-3125 ♦		6153 ♦	136 Microhenries, Wound on 5.6KΩ resistor
L28	2nd Sound IF	.4Ω	.4Ω	S-19962				
L29	Quadrature Coil	5Ω		S-19020			1480	

* Use adaptor plate.
■ Use adaptor plate and detune trap.
▲ Series with 2.7KΩ resistor.
♦ Parallel with 5.6KΩ resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	RCA TYPE No.	Ram PART No.	Thordarson PART No.	NOTES
L30	160Ω		S-19743	19-1577		6324				Tapped @ 67Ω

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ZENITH PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L31	.360A	46.5Ω	2.45HY	95-1399			C2334		

FUSES

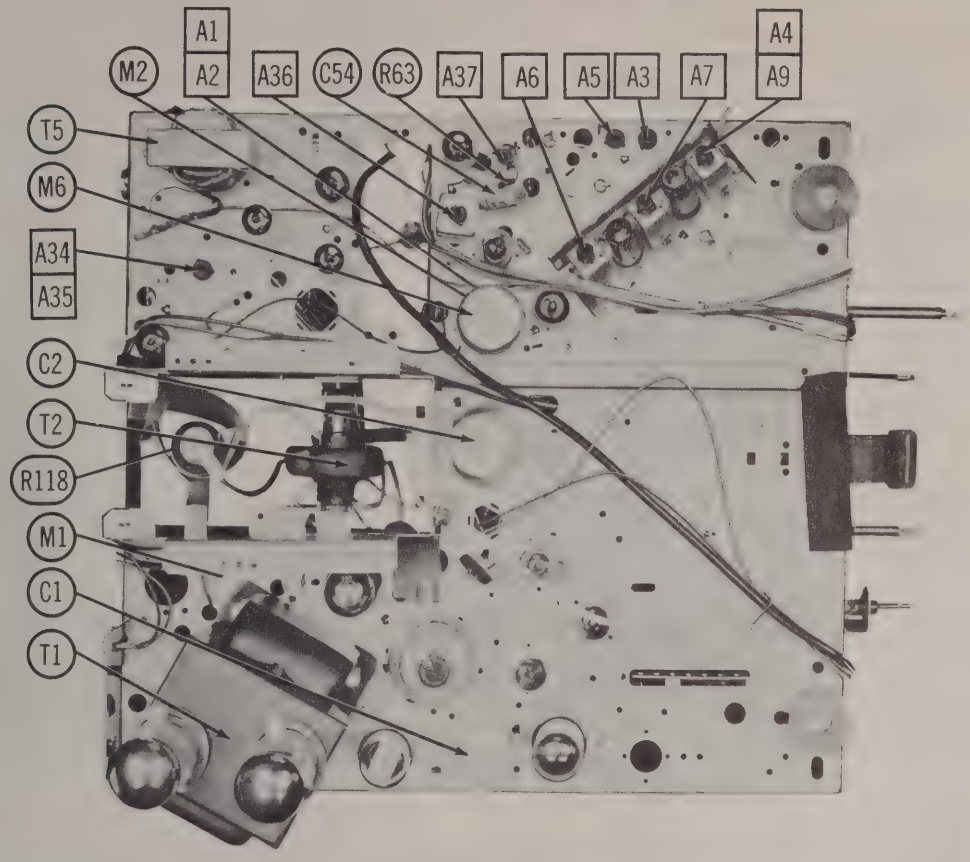
ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	1/4A 125V	136-22	83-1883	313.250 (3AG S/B 1/4A)	357001	MDL 1/4	4405

CRYSTAL DIODES

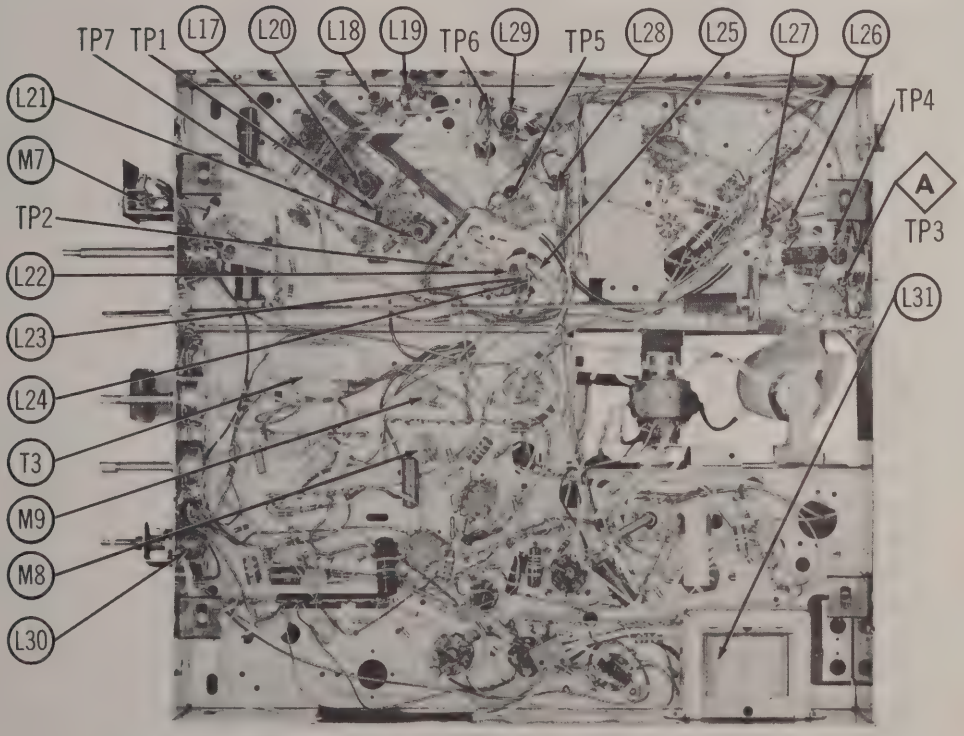
ITEM No.	ORIG. TYPE	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA SYLVANIA PART No.	NOTES
M2	1N64	103-1	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Dial Light	100-66	#PR-12
M4	Tuner	S21735	VHF (13 Position)-Chassis 22X20, 22X20Q
M5	Tuner	S23117	VHF-UHF Combination-Consists of VHF Tuner Part #S23113 and UHF Tuner Part #S23115. Chassis 22X20U and 22X20QU
M6	Video Det. Assy.	S-21686	Includes M2, L22, L23, L24, C41, and C42
M7	Switch	85-555	TV-Phono (3 Pole-2 Position, Slide Type)
M8	Integrator	87-5	Vertical
M9	Integrator	87-4	Vertical
M10	Focus Magnet	S-20344	Includes Centering Device
M11	Ion Trap	S-17461	
M12	Correction Magnet	S-18763	
M13	Correction Magnet	S-18763	
	Cabinet	14-1885E	Model X2359E, EU
	Cabinet	14-1882R	Model X2360R, RU
	Cabinet	14-1884E	Model X2362E, EU
	Cabinet	14-1884H	Model X2362H, HU
	Cabinet	14-1884R	Model X2362R, RU
	Cabinet	14-1893E	Model X2365EQ
	Cabinet	14-1893R	Model X2365RQ
	Cabinet	14-1889	Models X2383, U
	Cabinet	14-1889R	Models X2383R, RU
	Cabinet	14-1883E	Model X2391EQ
	Knob	46-1336	On-Off-Volume-Models X2359E, EU; X2362E, EU; X2365EQ, X2383, U; X2391EQ
	Knob	46-1335	On-Off-Volume-Models X2360R, RU; X2362H, HU; X2362R, RU; X2365RQ, X2383R, RU
	Knob Assy.	S-23141	Channel Selector-Models X2359E, X2362E, X2365EQ, X2383, X2391EQ
	Knob Assy.	S-23105	Channel Selector-Model X2360R, X2362H, X2362R, X2365RQ, X2383R
	Knob	46-1018	Tone (Bass)-Models X2359E, EU; X2360R, RU; X2362E, EU, H, HU, R, RU; X2365EQ, RQ; X2391EQ
	Knob	46-1055	Tone (Treble)-Models X2359E, EU; X2360R, RU; X2362E, EU, H, HU, R, RU; X2365EQ, RQ; X2383, U, R, RU; X2391EQ
	Knob	46-1153	Tone (Radio) 2used-Model X2391EQ
	Knob	46-1117	Horizontal Hold-Models X2359E, EU
	Knob	46-1118	Horizontal Hold -Models X2360R, RU; X2362E, EU, H, HU, R, RU; X2365RQ, EQ; X2383, U, R, RU; X2391EQ
	Knob	46-1181	Vertical Hold, Brightness, Contrast-All Models
	Knob	46-1411	Sensitivity-Models X2365RQ, EQ; X2391EQ
	Knob	46-1041	Tuning (Radio)-Model X2391EQ
	Knob	46-1043	Band Switch (Radio-Model X2391EQ
	Knob Assy.	S-19316	Volume (Radio)-Model X2391EQ
	Knob	S-22408	Fine Tuning-Models X2359E, X2360R, X2362E, H, R, X2365RQ, EQ; X2383, R; X2391EQ
	Knob	S-22025	UHF Dial-Models X2359EU, X2360RU, X2362EU, HU, RU; X2382U, RU
	Knob	S-22863	UHF Tuning-Models X2359EU, X2360RU, X2362EU, HU, RU; X2383U, RU
	Dial Crystal	192-138	Radio-Model X2391EQ

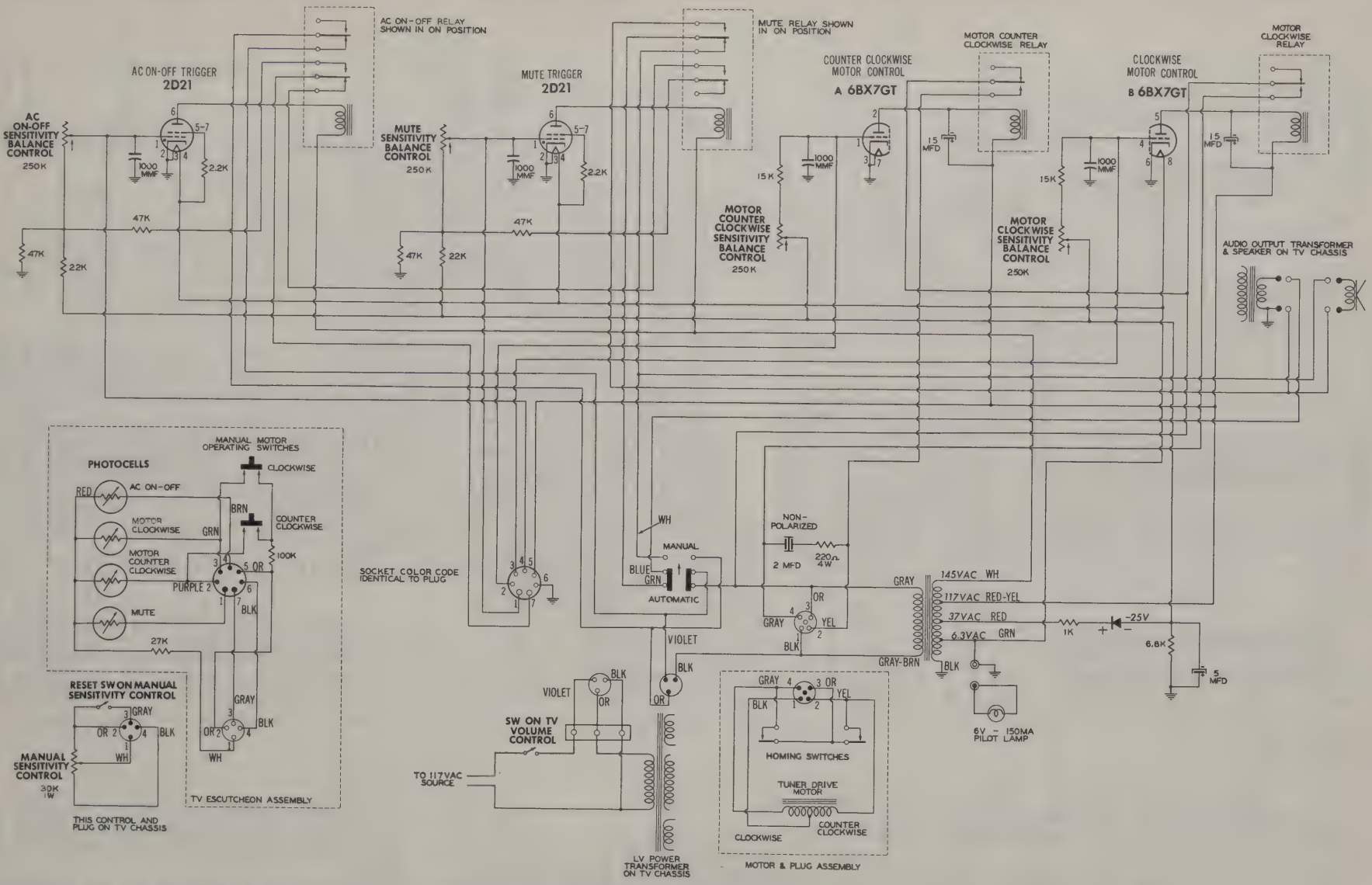


CHASSIS TOP VIEW



TP1	130V	GRID BIAS (V4)	TP5	50V	SOUND IF PLATE
TP2	7V	GRID BIAS (V5)	TP6	130V	B+ VOLTAGE
TP3	-.1V	VIDEO DET. OUTPUT	TP7	7V	RF-IF-BIAS
TP4	75V	VIDEO OUTPUT			

CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENT.



REMOTE CONTROL UNIT USED WITH CHASSIS 22X20Q, AND 22X20QU

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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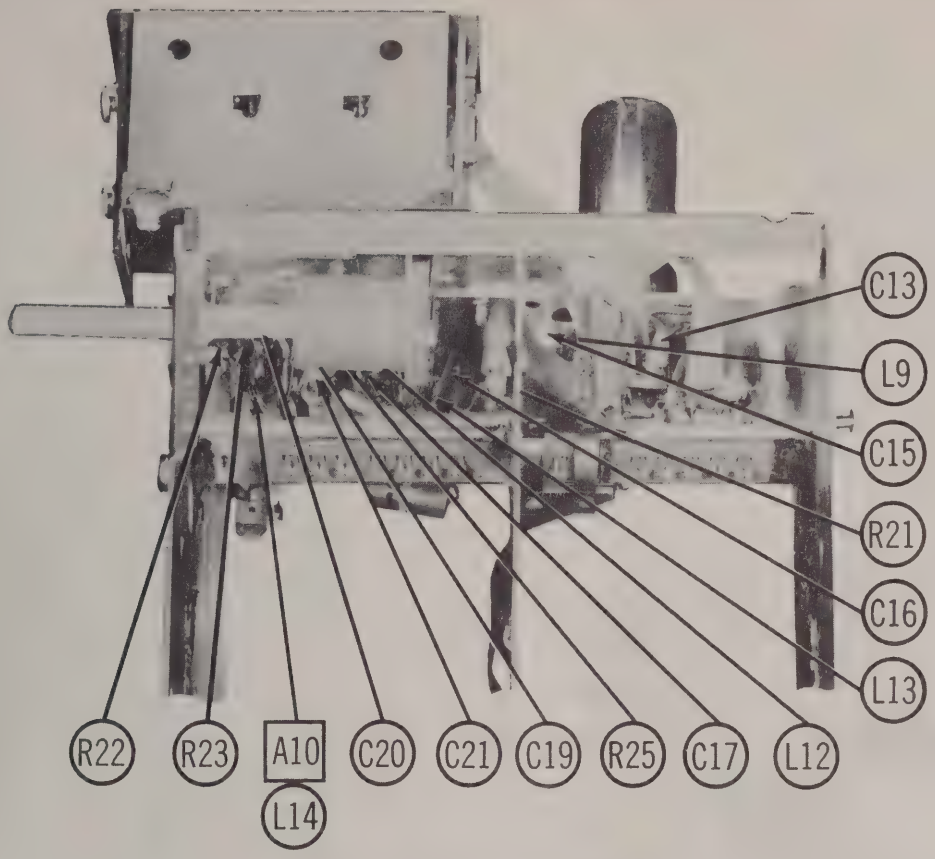
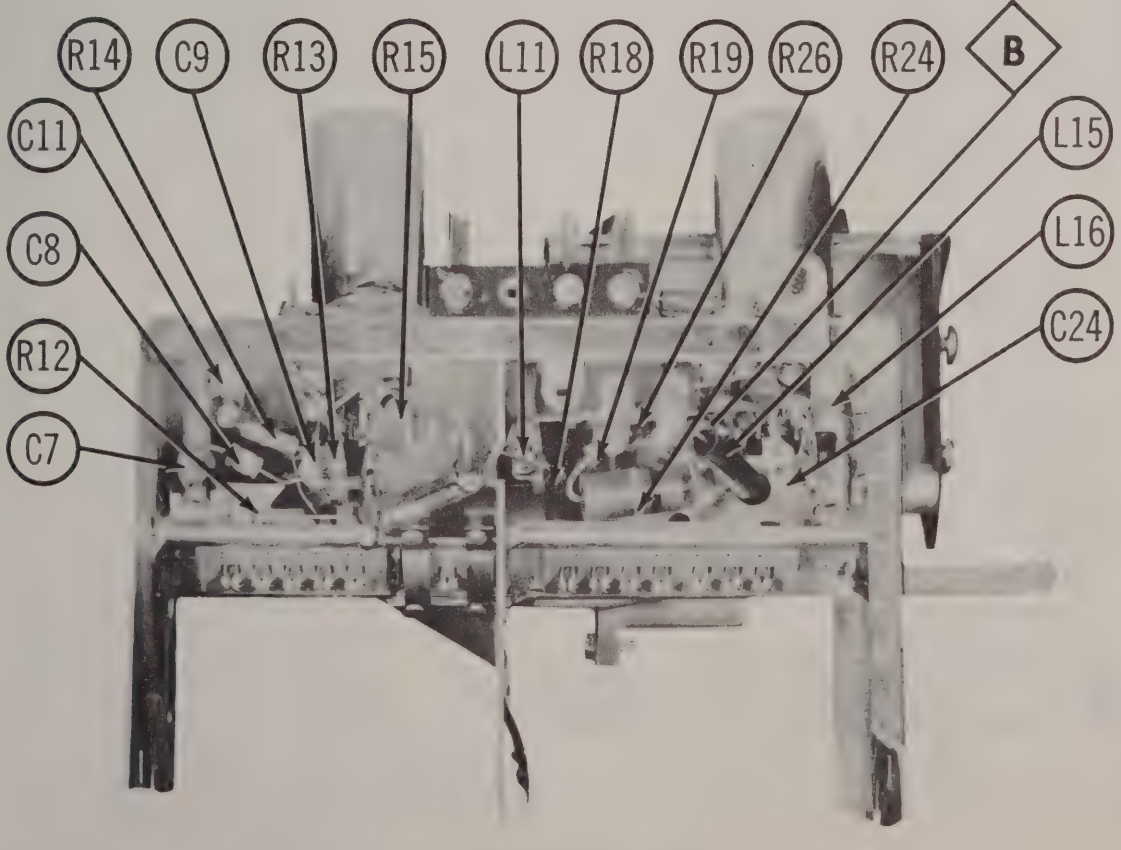
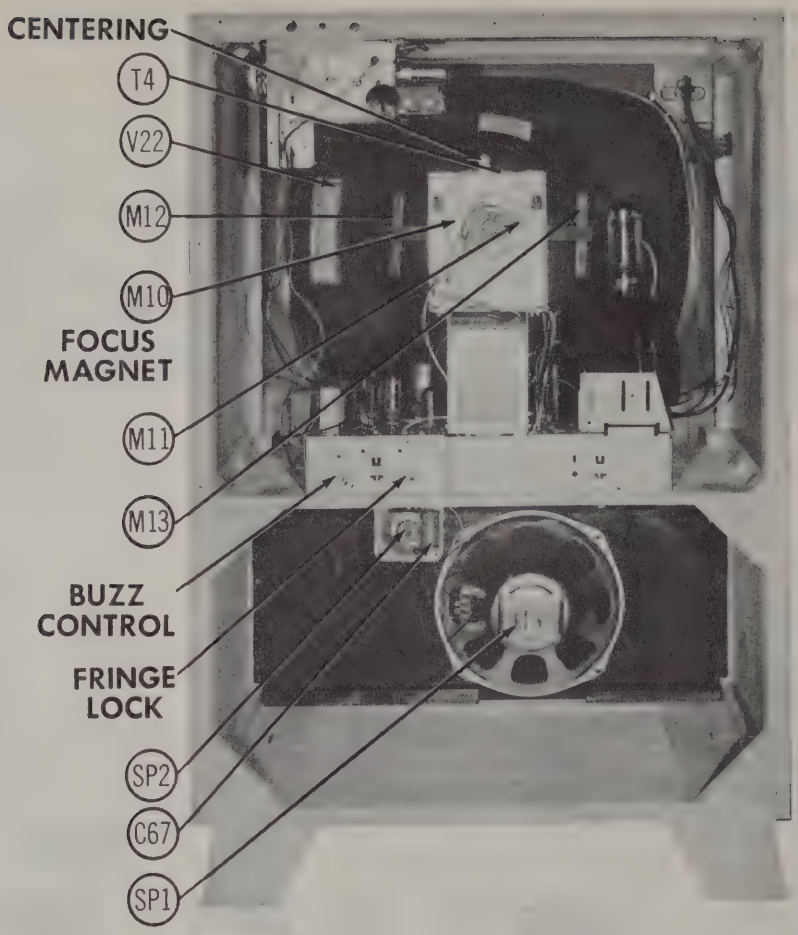
REMOTE CONTROL UNIT CIRCUIT



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

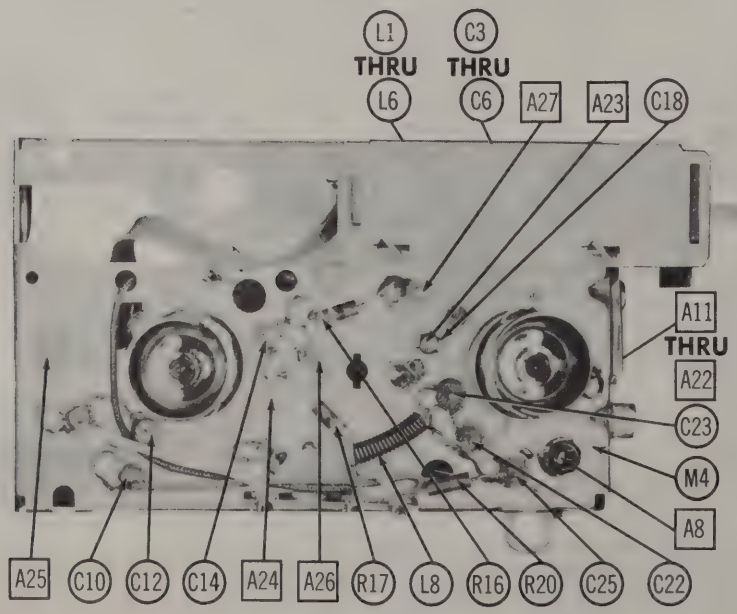


CABINET—REAR VIEW

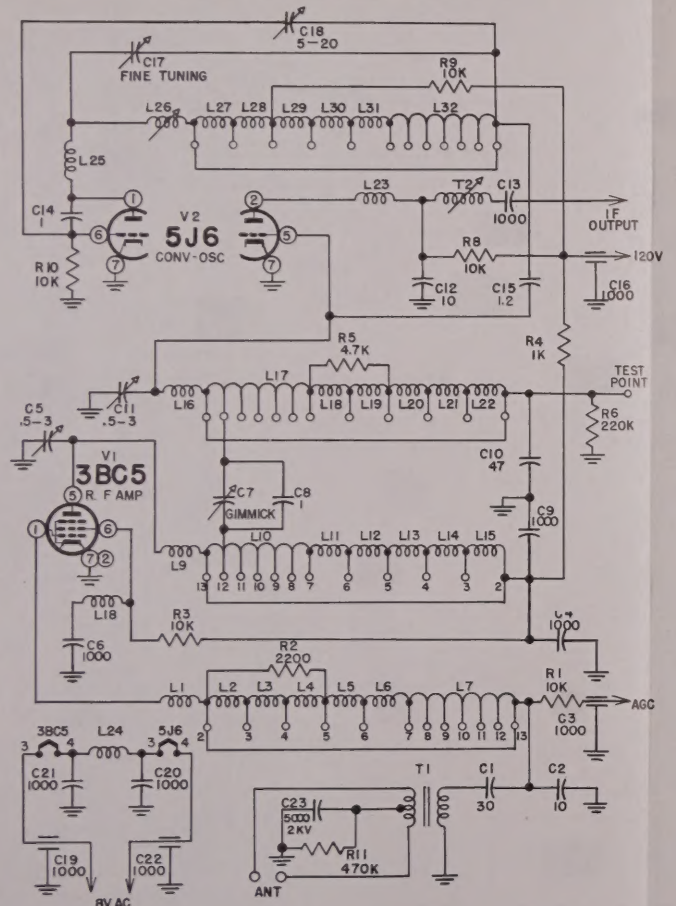
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.
Adjust the horizontal hold control until the picture synchronizes horizontally.

Adjust the width control (R9) for a picture slightly wider than necessary to fill the picture mask horizontally.



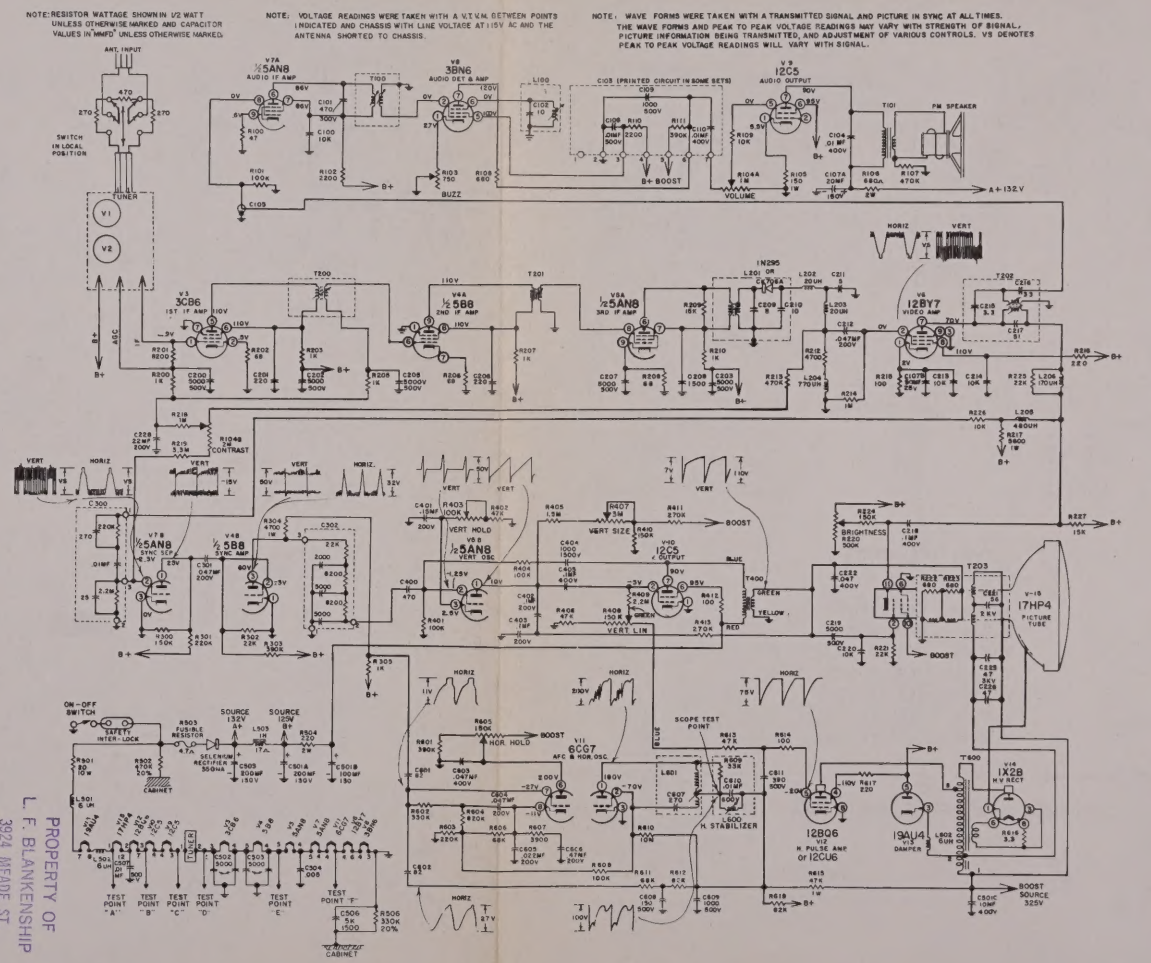
RF TUNER TOP VIEW



Schematic Courtesy of Gamble-Skogmo Inc.

CORONADO MODEL

TV1-9305A


NOTE: RESISTOR WATTAGE SHOWN IN 1/2 WATT UNLESS OTHERWISE MARKED AND CAPACITOR VALUES IN MMFD UNLESS OTHERWISE MARKED.
NOTE: VOLTAGE READINGS WERE TAKEN WITH A V.T.V.M. BETWEEN POINTS INDICATED AND CHASSIS WITH LINE VOLTAGE AT 115V AC AND THE ANTENNA SHORTED TO CHASSIS.
NOTE: WAVE FORMS WERE TAKEN WITH A TRANSMITTED SIGNAL AND PICTURE IN SYNC AT ALL TIMES. THE WAVE FORMS AND PEAK TO PEAK VOLTAGE READINGS MAY VARY WITH STRENGTH OF SIGNAL, PICTURE INFORMATION BEING TRANSMITTED, AND ADJUSTMENT OF VARIOUS CONTROLS. VS DENOTES PEAK TO PEAK VOLTAGE READINGS WILL VARY WITH SIGNAL.
ANT. INPUT
SWITCH IN LOCAL POSITION
TUNER
V1
V2
V7A 1/2 5AN8 AUDIO IF AMP
V8 3BN6 AUDIO DET & AMP
V9 12C5 AUDIO OUTPUT
FM SPEAKER
VOLUME
BUZZ
B+ BOOST
A+ 132V
V3 3CB6 1ST IF AMP
V4A 1/2 5B8 2ND IF AMP
V4B 1/2 5B8 3RD IF AMP
1N295
V6 12BY7 VIDEO AMP
CONTRAST
V7B 1/2 5AN8 SYNC SEP
V4B 1/2 5B8 SYNC AMP
V8 1/2 5AN8 VERT OSC
VERT HOLD
VERT SIZE
V10 12C5 OUTPUT
VERT LIN
BRIGHTNESS
BOOST
V-15 17HP4 PICTURE TUBE
ON-OFF SWITCH
SAFETY INTER-LOCK
SOURCE 132V
SOURCE 120V
SELENIUM RECTIFIER
CABINET
V11 6CG7 AFC & HOR. OSC.
HOR HOLD
H STABILIZER
V12 12B06 H PULSE AMP or 12CU6
V13 19AU4 DAMPER
V14 1X2B H.V. RECT
BOOST SOURCE 325V
TEST POINT "A"
TEST POINT "B"
TEST POINT "C"
TEST POINT "D"
TEST POINT "E"
TEST POINT "F"

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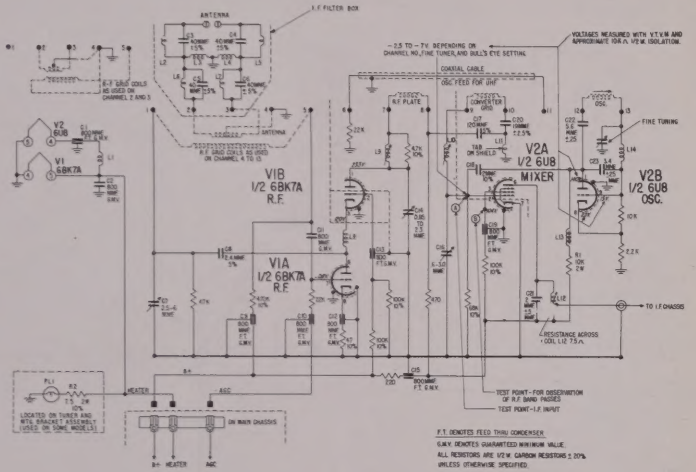

ZENITH MODELS

Y2229R (Ch. 19Y22)
Y2230E (Ch. 19Y22)
Y2230R (Ch. 19Y22)
Y2254M (Ch. 19Y22)
Y2256E (Ch. 19Y22)
Y2256R (Ch. 19Y22)
Y2263R (Ch. 19Y22)

Schematic Courtesy of Zenith Radio Corp.